



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF  
LAND AND EMERGENCY  
MANAGEMENT

### MEMORANDUM

**SUBJECT:** Update to Responses to Office of Inspector General June 15, 2018, Report Recommendations and August 22, 2018 (No. 18-P-0233) Report entitled "EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Nation Lands."

**FROM:** Shahid Mahmud, Director  
Office of Mountains, Deserts and Plains

SHAHID  
MAHMUD

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**TO:** Katherine Trimble  
Assistant Inspector General  
Office of Audit  
Office of Inspector General

The United States Environmental Protection Agency (EPA) is providing this update to the Office of Inspector General (OIG) on its progress with the corrective actions identified in the report titled, "EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Nation Lands" (Report No. 18-P-0233). The Report focused on the 54 Tronox Navajo Area Uranium Mines (NAUMs) on the Navajo Reservation or on private land within the State of New Mexico. Corrective actions include completion of Engineering Evaluation and Cost Analysis (EE/CAs) for these sites and refining and finalizing a prioritization methodology and resource allocation strategy for the Tronox settlement NAUM mine site cleanups. As reported in the December 29, 2020, update to the OIG, EPA Region 6 is the lead on 18 mines and EPA Region 9 is the lead on 35 mines. The 54th mine, Spencer Mine, was reclaimed by the State of New Mexico with funding by the Bureau of Land Management, and no further EPA action is planned for that site. Corrective actions include completion of Engineering Evaluation and Cost Analysis (EE/CAs) for these sites and refining and finalizing a prioritization methodology and resource allocation strategy for the Tronox settlement NAUM mine site cleanups. The prior update to OIG also explained that the Office of Mountains, Deserts and Plains (OMDP) would provide future responses to the OIG. An updated table summarizing completed activities and activities that remain outstanding can be found at the end of this memorandum. The table has been updated to reflect actions completed since December 2020. A memo describing the recently completed Tronox Allocation Strategy is provided as an attachment to this document.

#### Corrective Action 1.2 - Complete Engineering Evaluations/Cost Analyses

EPA has completed draft final Engineering Evaluations/Cost Analyses (EE/CAs) that cover the 54 Tronox NAUMs where additional work is anticipated.<sup>1</sup> The Navajo Nation has requested to comment on draft final EE/CAs without a recommended alternative prior to EPA selection of such an alternative. Section 33 Mine is located on private land in New Mexico and is commingled with Section 32 Mine on Navajo Nation. Section 32 and Section 33 will be addressed jointly with Region 9 as the lead region with Region 6 support. One of the 54 Tronox NAUMs, Spencer Mine, was reclaimed by the State of New Mexico with funding by the

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<sup>1</sup> EE/CAs are complete for 25 sites (20 in Region 6 and 5 in Region 9). Region 9 is drafting EE/CAs for the remaining 29 sites, which plan to be complete by December 31, 2021.

Bureau of Land Management, and no further EPA action is planned for that site. This results in Region 6 having 18 remaining Tronox NAUMs to address.

#### Corrective Action 2.4 - Complete Prioritization List for Funding

During 2021, EPA completed its prioritization methodology, including scoring sheets that provide a relative ranking of the 54 NAUMs under the Tronox settlement. EPA has shared this prioritization methodology and relative ranking with both OIG and its regulatory stakeholders in the State of New Mexico and Navajo Nation. Prioritization was necessary to determine the sequence of response actions among the 54 NAUMs, a process distinct from allocation, discussed below, dividing the settlement proceeds among the NAUMs for CERCLA response. No further EPA action is planned for the prioritization methodology or the relative ranking prioritization list. EPA anticipates that allocated funds will be made available to initiate negotiations and/or response actions at the time such actions are selected for each mine or mine grouping to be addressed as a separate site. EPA Region 6 will work with New Mexico and EPA Region 9 with Navajo Nation on selecting response actions within their respective jurisdictions.

#### Corrective Action 2.4 - Establish a Funding Allocation Strategy for the Prioritized NAUM Sites

During 2021, EPA completed its Tronox Allocation Strategy (Attachment).<sup>2</sup> Settlement funds will be distributed among EPA special accounts established for the Tronox NAUM mines or mine groupings consistent with the allocation strategy. This Strategy will inform the final resource allocation to be completed by May 31, 2022. In September 2021, EPA initiated discussions with its regulatory stakeholders concerning the proposed allocation strategy. EPA met jointly with representatives of the Navajo Nation and the State of New Mexico on October 13, 2021, to present the draft strategy and request written comments on the strategy. EPA met again with Navajo Nation and the State of New Mexico on November 9, 2021, to answer written comments and gather additional input from these external partners on the proposed strategy. Correspondence concerning the Tronox Allocation Strategy was received on November 5, 2021, from New Mexico and November 9, 2021, from Navajo Nation. EPA responded to comments received on November 16, 2021. On November 18, 2021, EPA Regions 6 and 9 held government to government consultation with Navajo Nation. EPA Region 9 provided a follow-up response to consultation. On November 30, 2021, Navajo Nation President Nez and Vice President Lizer provided a letter to EPA summarizing their position following the consultation. On December 17, Region 9 send a letter to Navajo Nation responding to that November 30, 2021 correspondence and describing the conclusion of the consultation process.

#### **Summary of Next Steps:**

OMDP, and EPA Regions 6 and 9, will complete its final resource allocation by May 2022.

OMDP appreciates the opportunity to report the progress made in addressing the Tronox NAUM mine sites in Regions 6 and 9.

cc:

Attachment: Tronox Allocation Strategy Memo

<b>Original Corrective Actions and Status</b>			
<b>No.</b>	<b>Recommendation</b>	<b>High-level Intended Corrective Actions</b>	<b>Estimated Completion / Region 6 and 9 Completion Status</b>

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<sup>2</sup> The December 2020 OIG response from EPA indicated that a “short, medium, and long-term funding allocation strategy” would be developed by December 31, 2021. EPA has since determined that it is more appropriate to follow policy and guidance for disbursing Special Account funds and is not reporting a short, medium, and long-term strategy.

1	Complete the necessary removal site evaluations and engineering evaluations/cost analyses.	1.1 Complete removal site evaluations (RSEs).	COMPLETED May 31, 2019
		1.2 Complete engineering evaluations/cost analyses (EE/CAs).	<p>COMPLETED – December 31, 2020</p> <p>Region 6 EE/CAs completed Draft Final EE/CAs for 20 NAUMs</p> <p>COMPLETED – December 31, 2021</p> <p>Region 6 and Region 9 completed draft final EE/CAs for 53 Tronox NAUMs.</p> <p>Region 9- Five draft final EE/CAs for NAUMs were completed September 30, 2021, consistent with the December 2020 OIG response.</p>
2	Fully develop and implement prioritization and resource allocation methodologies for the Tronox abandoned uranium mine sites on or near Navajo Nation lands.	2.1 Complete development of prioritization methodology.	COMPLETED - May 31, 2019
		2.2 Refine prioritization methodology.	COMPLETED - Draft Final July 2020
		2.3 Conduct mine cleanup prioritization.	<p>COMPLETED - Region 6 and Region 9 have completed–Relative prioritizations for Tronox Mines</p> <p>Region 6 completed October 30, 2020</p> <p>Region 9 completed Relative prioritizations for the 34 Tronox Mines December 31, 2020.</p> <p>COMPLETED - Share relative prioritization methodology results with Navajo Superfund Program (NSP) and State of New Mexico by January 15, 2021</p>
		2.4 Complete development and implementation of resource allocation methodology following the cost analysis of the preferred remedies	<p>COMPLETED - Complete prioritization list for funding by December 31, 2021</p> <p>COMPLETED - Establish a funding allocation strategy for the prioritized NAUM sites by December 31, 2021</p> <p>Complete final resource allocations by May 31, 2022</p>

**Tronox Navajo Area Uranium Mines  
Draft Settlement Funding Allocation Strategy  
USEPA Tronox Allocation Workgroup<sup>1</sup>  
November 5, 2021**

**I. Introduction**

Two settlements (“2011 and 2015 Consent Decrees” or “Tronox Settlements”) in the Tronox Inc. Bankruptcy in the Southern District of New York and related litigation, provided USEPA with approximately \$900 million to address 54 Tronox Navajo Area Uranium Mines (Tronox NAUMs). Twenty of the mines are located in USEPA Region 6 (on private land in New Mexico outside of the Navajo Nation) and 34 in USEPA Region 9 (on tribal land within the Navajo Nation) (*see* map provided as Attachment 1). When USEPA first received this funding, the costs of investigation and cleanup of the mines were unknown. This resulted in uncertainty concerning whether the settlement funds would be sufficient to complete all tasks required under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 *et seq.*, to address the contamination at the 54 Tronox NAUMs. While final remedies have not been selected, USEPA investigations, analyses of alternatives and development of cost estimates have made it clear that the Tronox settlement funds will be insufficient to perform the required work. Consistent with the Tronox Settlements, USEPA has developed a draft funding allocation strategy with the goal of creating appropriate incentives for full funding by the remaining non-Tronox potentially responsible parties (PRPs), so that cleanup work can begin as soon as possible after response actions are selected. This memorandum describes the assumptions and considerations the USEPA Tronox Allocation Workgroup has utilized, as well as the resulting strategy and planned next steps. The memo is intended for distribution to regulatory stakeholders for their input. After regulatory stakeholder’s input has been considered, a final version of the allocation strategy will be provided to the USEPA Office of Inspector General, which initiated an audit in 2017 (see Attachments 2 and 3).

**II. Background**

The 54 Tronox NAUMs are located in the Grants Mineral Belt, which runs through both steep mesas in Arizona as well as flatter lands to the east in New Mexico. Mining occurred primarily in the 1940s through the 1970s. While Tronox’s predecessor Kerr McGee Corporation was the primary operator of the mines, USEPA has issued notice of potential liability to other parties, including other mining companies that operated the Sites and federal agencies that participated in leasing and incentivizing production of uranium ore. The non-Tronox PRPs include parties that are familiar with the issues presented because these parties have participated in discussions, settlements and in some cases litigation, regarding the responsibility for cleanup of other uranium mine sites in the Grants Mineral Belt.

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<sup>1</sup> USEPA’s Tronox Allocation Workgroup includes members of USEPA’s Office of Mountains, Deserts and Plains (OMDP), Office of Superfund Remediation and Technological Innovation (OSRTI), Office of Emergency Management (OEM), Office of Site Remediation Enforcement (OSRE) and Regions 6 and 9.

### **III. Assumptions, Considerations and Funding Allocation Strategy**

#### **A. Assumptions**

**Insufficiency:** A key assumption, based on investigations and cost analyses to date, is that the funds currently available in the Tronox Special Accounts (\$924 million with interest) will be insufficient to cover the full costs of cleanup for the 54 Tronox NAUMs. USEPA's work to date has shown that even if the least expensive options that might be protective were implemented, Tronox funding alone would be insufficient. Based on current estimates, USEPA expects the insufficiency of funds to be substantial. *See* Attachments 4 and 6.

**Remedy/Cost Uncertainty:** USEPA investigations of site conditions and the development response action options and associated cost estimates are ongoing for the 54 Tronox NAUMs. The total funding required for full cleanup of the 54 Tronox NAUMs will not be known with certainty for a relatively long period, most likely a decade or more.

**Other Financially Viable non-Tronox PRPs:** As detailed below, there are financially viable non-Tronox PRPs for all but three of the Tronox NAUMs that require additional response actions but federal agencies may also be liable at those three sites.

**Maximize Non-Tronox PRP Incentives to Settle:** Allocation of the Tronox settlement proceeds is needed to begin negotiations with the non-Tronox PRPs and to secure full funding for cleanup at all 54 Tronox NAUMs.

**Avoid Pre-Decisional Actions:** The Workgroup sought to avoid pre-decision assumptions and considered the range of alternatives that could potentially be selected to address the 54 sites. Given that there is an implementable protective regional waste repository option for Region 6, the Workgroup did not use the more expensive option of disposal of off-site licensed facilities for the R6 Tronox NAUMs. For Region 9, however, the option of licensed off-site facilities is still among options that the Workgroup found is likely to receive further consideration, even though regional repositories remain a possibility. While the use of this most expensive option in Region 9 remains the strong preference of the Navajo Nation, a decision has not yet been made. USEPA will make the final response action selections consistent with CERCLA, the NCP and other program guidance.

**Impact on Non-Tronox PRPs:** The Workgroup considered the need to ensure that the chosen strategy would be fair to both PRPs whose sites were addressed sooner, as well to those whose sites would be addressed later.

**Fair, Reasonable, in the Public Interest and Consistent with the CERCLA/NCP:** The allocation strategy needs to result in settlements with or orders to private parties that would be readily approvable and enforceable by federal courts.

#### **B. Considerations**

**Expedite Cleanup:** A key consideration for selecting the Allocation Strategy was expediting cleanup. While some sites had significant reclamation, impacted environmental justice communities have waited decades for final protective cleanups. Interim actions have reduced exposure, but uncertainty about the nature and timing of final cleanup has been disruptive for the affected communities. Finalizing a resource allocation as a basis for engaging the non-Tronox PRPs will allow USEPA to move promptly to fully fund and begin cleanups at the Tronox NAUM sites.

**Minimize Funding Shortfall, including for Cleanup and Post-Removal Site Control:** A second consideration, consistent with USEPA policy, is to ensure that PRPs fully fund the costs of cleanup.

### **C. Enforcement:**

Based on prior litigation and settlements, the Workgroup is confident that enforcement against the known, viable non-Tronox PRPs will be successful. As noted above, the non-Tronox financially viable PRPs include former mine operators and federal agencies. An April 2019 federal district court decision (*El Paso Natural Gas v. U.S.*), regarding a group of 19 non-Tronox uranium mines in Western Navajo Nation, established that neither the mining company operators nor the federal agencies in that very similar case had successful defenses to CERCLA liability. None of the parties to that litigation appealed. *See* Attachment 5. In addition, in three settlements for other similar mine sites, between 2011 and 2018, the U.S. agencies and the mining companies agreed to contribution claims against the United States for roughly 25% - 50% of total response costs. These settlements provide additional assurance that enforcement against the non-Tronox PRPs will be successful.

## **IV. Funding Allocation Strategy**

**Proportional Funding/Bankruptcy Claims Model:** The proportional allocation strategy the Workgroup developed is similar to a bankruptcy court approach and is appropriate given that the Tronox assets are insufficient to pay all claims. The Workgroup selected this approach because it met the criteria described above.

**Equal Percentage of Capital Costs:** For sites with viable PRPs, the Workgroup selected having the Tronox Settlement fund an equal percentage of capital costs at each mine or mine grouping. Non-Tronox PRPs would pay 100% of all costs exceeding their share of the allocated Tronox settlement funds (*see* Attachment 6).

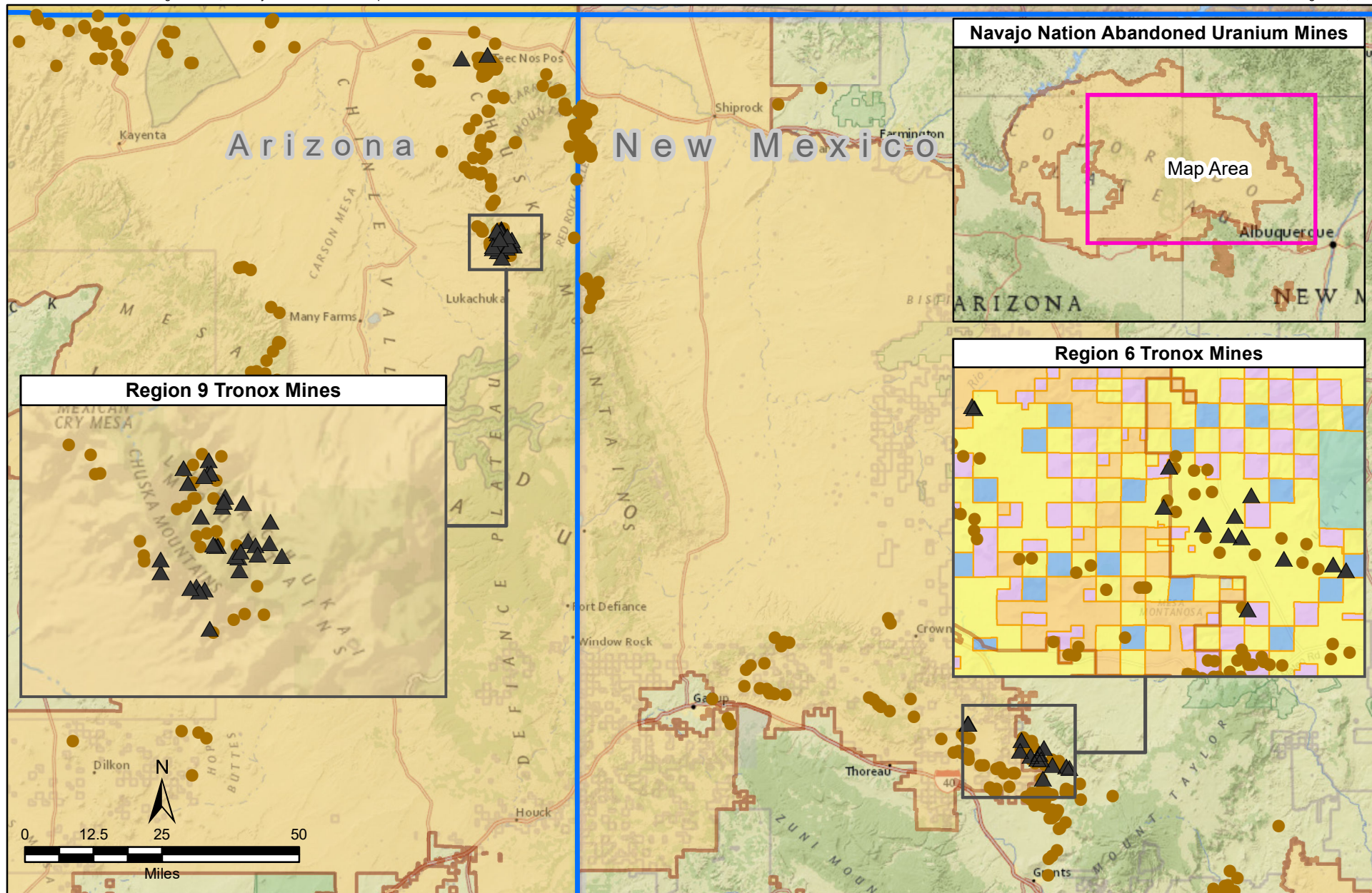
## **V. Conclusions**

Based on the factors discussed above, the Tronox Allocation Workgroup has proposed the draft Tronox Settlement Funding Allocation Strategy for regulatory stakeholder review and input. At an October 13, 2021 virtual meeting, USEPA met with representatives of Navajo Nation EPA and State of New Mexico agencies and requested their input. A follow-up meeting with regulatory stakeholders is scheduled for November 9, 2021. The OIG deadline for USEPA to complete the funding allocation strategy is December 31, 2021. The OIG deadline for USEPA to complete the final resource allocation is May 31, 2022 (*see* Attachment 3 at p. 5).

## **VI. Attachments**

1. Map showing location of Tronox NAUMs
2. OIG Audit Report 2018
3. Regions 6 and 9 Report to OIG, dated December 29, 2020
4. Tronox NAUM Cost Estimate Table
5. *El Paso Natural Gas v. United States*, No. CV14-8165-PCT-DGC, (D. Ariz. April 16, 2019) (<https://casetext.com/case/el-paso-natural-gas-co-v-united-states-9> )
6. Tronox Allocation Strategy PowerPoint shared with Navajo Nation and New Mexico, October 13, 2021





- Legend**
- Abandoned Uranium Mine
  - ▲ Tronox Abandoned Uranium Mine
  - EPA Region Boundary
  - Navajo Nation Boundary
  - Bureau of Land Management
  - Forest Service
  - Private Land
  - State Land
  - Tribal Land

Abandoned Uranium Mines  
**Tronox Mines - EPA Regions 6 and 9**





U.S. ENVIRONMENTAL PROTECTION AGENCY

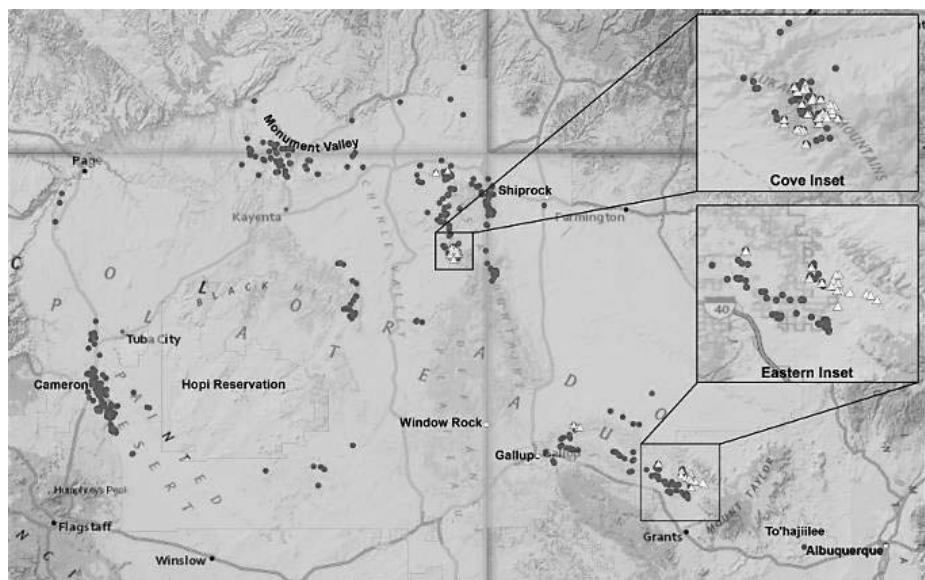
OFFICE OF INSPECTOR GENERAL

## *Cleaning up and revitalizing land*

# **EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Lands**

Report No. 18-P-0233

August 22, 2018





**Report Contributors:**

Christina Lovingood  
Patrick Milligan  
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Kate Robinson  
Roopa Mulchandani

**Abbreviations**

ASPECT	Airborne Spectral Photometric Environmental Collection Technology
AUM	Abandoned uranium mine
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	U.S. Environmental Protection Agency
GAO	U.S. Government Accountability Office

**Cover Image:** The map represents the Tronox Mines on or near Navajo Nation lands.  
(EPA-generated map)

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# At a Glance

## Why We Did This Review

We conducted this review to determine whether the U.S. Environmental Protection Agency (EPA) had a method for prioritizing cleanup of the approximately 50 abandoned uranium mine (AUM) sites on or near Navajo Nation lands covered under a special account established in 2015 totaling approximately \$1 billion; and whether the EPA has a resource allocation methodology for the special account funds that accounts for estimated cleanup cost, timeframe for cleanup, and scope of cleanup for the 50 sites.

Health effects from uranium exposure can include impacts to autoimmune and reproductive functions, high blood pressure, kidney or lung damage, and bone cancer.

### **This report addresses the following:**

- *Cleaning up and revitalizing land.*

Send all inquiries to our public affairs office at (202) 566-2391 or visit [www.epa.gov/oig](http://www.epa.gov/oig).

Listing of [OIG reports](#).

## ***EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Lands***

### **What We Found**

The EPA has taken steps to develop a prioritization methodology for cleaning up AUM sites on or near Navajo Nation lands that are part of a 2015 settlement with a chemical company, Tronox Incorporated. In conjunction with Tronox AUM cleanup stakeholders, the EPA has developed a system for identifying immediate risks and, where necessary, has taken the removal actions needed. The EPA has been following the National Contingency Plan for assigning risk to the sites and is gathering the data needed to complete prioritization for all Tronox AUM sites covered by the settlement. The EPA is tracking the estimated cleanup costs, timeframe for cleanup, and scope of cleanup for some of the Tronox AUM sites where work has already been conducted. After the prioritization methodology is developed, the EPA will be able to develop a resource allocation methodology for the Tronox AUM sites based on estimated cleanup costs, timeframe for cleanup and scope of cleanup.

**Site prioritization will aid EPA-initiated actions where there is imminent danger at numerous sites in the same area.**

Regions 6 and 9 have agreed on a timeline to complete the key activities necessary to finalize their prioritization methodology. It is critical that the EPA meet its milestones, including by the end of calendar year 2020, that EPA finalize the prioritization of Tronox AUM sites. Also, by the end of calendar year 2021, the EPA has agreed to complete development and implementation of the resource allocation methodology following the cost analysis of the preferred remedies. The regions' efforts will help result in the effective use of the Tronox special account and will help provide continued protection of human health and the environment.

### **Recommendations and Planned Agency Corrective Actions**

We recommend that the Region 6 and 9 Regional Administrators complete the necessary removal site evaluations and engineering evaluations/cost analyses; and fully develop and implement prioritization and resource allocation methodologies for the Tronox AUM sites on or near Navajo Nation lands. The agency agreed with the recommendations and corrective actions are pending.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

August 22, 2018

**MEMORANDUM**

**SUBJECT:** EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Lands  
Report No. 18-P-0233

**FROM:** Arthur A. Elkins Jr.

A handwritten signature in dark ink, appearing to read "Arthur A. Elkins Jr.", is placed to the right of the "FROM:" line.

**TO:** Anne L. Idsal, Regional Administrator  
Region 6

Mike Stoker, Regional Administrator  
Region 9

This is our report on the subject audit conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency. The project number for this audit was OPE-FY17-0023. This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

**Action Required**

In accordance with EPA Manual 2750, your office provided acceptable corrective actions and milestone dates in response to OIG recommendations. All recommendations are resolved and no final response to this report is required. However, if you submit a response, it will be posted on the OIG's website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at [www.epa.gov/oig](http://www.epa.gov/oig).

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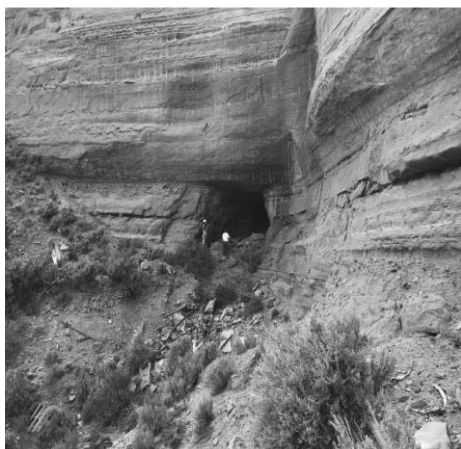
## Purpose

The purpose of this audit was to determine whether the U.S. Environmental Protection Agency (EPA) has a method for prioritizing cleanup of the 50 abandoned uranium mine (AUM) sites<sup>1</sup> on or near Navajo Nation lands covered under a special account established in 2015 totaling approximately \$1 billion; and whether the EPA has a resource allocation methodology for the special account funds that accounts for estimated cleanup costs, timeframe for cleanup, and scope of cleanup for the 50 sites.

## Background

The Navajo Nation covers over 27,000 square miles in portions of three states: Arizona, New Mexico and Utah. There has been widespread uranium mining on Navajo Nation lands, beginning in the early 1900s. Peak uranium mining occurred between the 1940s and 1960s in support of the U.S. government's defense programs. Substantial amounts of land throughout the Navajo Nation were disturbed by surface and underground mining. Most uranium mining activities on Navajo Nation lands ended in 1968. According to the EPA, mines were operational until the 1980s but the legacy of contamination from the AUMs continues.

### ***Tronox Settlement Agreement***



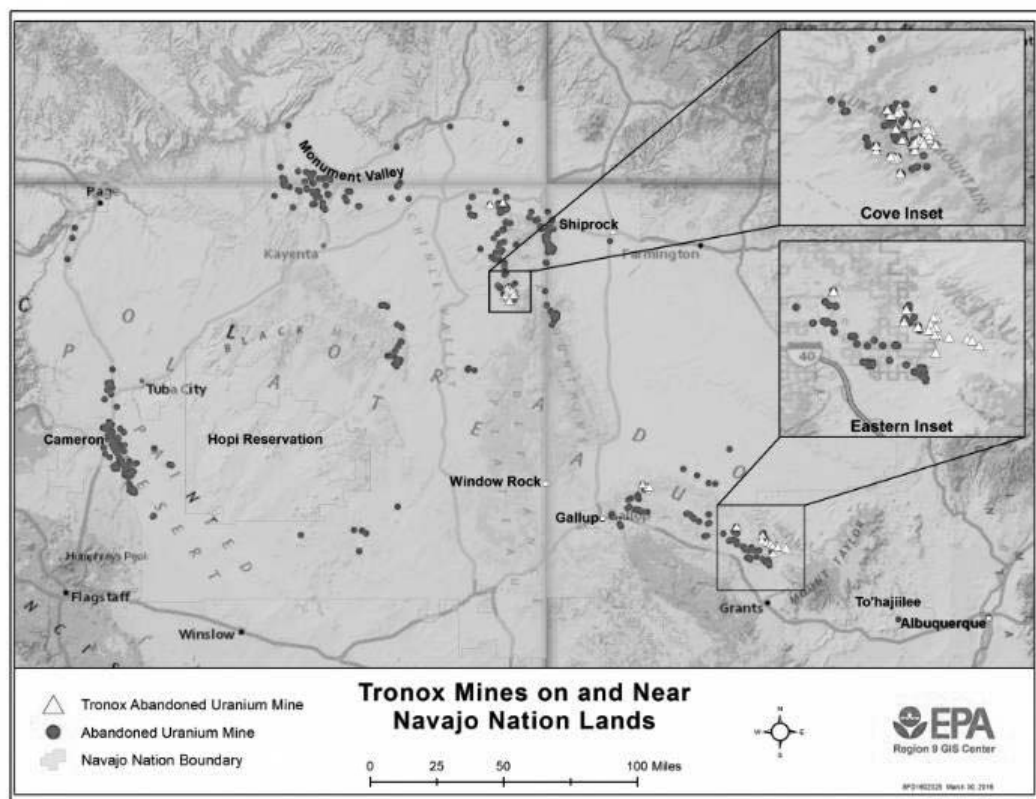
Tronox Mesa V Shaft in Arizona.  
(EPA photo)

On January 21, 2015, the EPA recovered approximately \$1 billion from a chemical company, Tronox Incorporated, in a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) settlement to address its liability for the activity of a predecessor company, Kerr McGee Corporation, which operated approximately 50 mines on or near Navajo Nation lands. The approximately \$1 billion in funds the EPA received for the cleanup at the about 50 Navajo area uranium mines has been deposited into an EPA Superfund special account. In accordance with CERCLA Section 122(b)(3), special accounts are site-specific, interest-bearing sub-accounts housed within the EPA's Hazardous Substance Superfund Trust Fund. Charges to a special account must be consistent

with the terms of the settlement pursuant to which the funds are received. Special account funds may be used for a wide range of site-specific CERCLA response actions.

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<sup>1</sup> Subsequent to our issuance of the notification memorandum, we found that there were over 50 mines included in the settlement.



Source: EPA Region 9.

Tronox special account funds, designated for specified uranium mine sites in or near Navajo Nation territory, can be used to support activities related to the assessment and cleanup at the approximately 50 mines and contamination caused by the mines. Examples of these activities include:

- Inform and involve the community in the CERCLA response.
- Investigate the nature and extent of the contamination in water, soil, sediment and air.
- Install fences to control access and display signs to warn people about dangerous areas.
- Protect cultural and biological resources in the mine areas.
- Construct access roads to the mines for cleanup operations.
- Close mine openings and address other physical hazards.
- Conduct removal and cleanup activities.

### ***Impacts on Human Health and Environment from Uranium Contamination***

Contact with uranium or radiation from AUMs can come from living in a home built with material from a mine or mill site, or from drinking contaminated water. Health effects from uranium exposure can include impacts to autoimmune and reproductive functions, high blood pressure, kidney or lung damage, and bone



cancer. For example, at high concentrations, uranium has a toxic, chemical effect, and people have developed kidney disease drinking highly contaminated water for long periods. In 2001, the Navajo Nation issued a health advisory recommending that people drink water from regulated safe drinking water sources that are tested routinely to ensure their safety.

Uranium contamination can also impact the environment. Mining practices at AUMs often disturbed the soils, thus making them less stable and more susceptible to erosion. Soils disturbed by mining are also likely to support less vegetation, or may support a new species mix due to changes in soil composition. In the air, uranium exists as dust. Very small dust-like particles of uranium fall onto surface water, plant surfaces and soil either by themselves or during rainfall.

### ***Initial Work to Assess Abandoned Uranium Mines***

In 2002, the EPA used its Hazard Ranking System<sup>2</sup> to initially assess the AUM sites based on a limited subset of the locational-distance criteria in the Hazard Ranking System. It does not include the complete set of criteria and factors built into the full Hazard Ranking System model. The scoring is not intended to identify actual risks, but rather to identify and prioritize areas for future investigation and response decisions. The EPA conducted its work using the



An EPA contractor and college interns collecting water and sediment samples in the Arizona Cove Wash in April 2017. (EPA photo)

National Contingency Plan as its criteria. The National Contingency Plan provides the framework for the EPA to address cleanup at the AUM sites, take actions at sites where there is imminent danger, and gather the data needed to complete prioritization of all Tronox sites.

In June 2005, the Navajo AUM Project<sup>3</sup> initiated a series of reports to document preliminary scoring results for AUMs in the six AUM regions in the Navajo Nation. For the first 5 years, the agencies involved focused on collecting data; identifying the most imminent risks; and addressing contaminated structures, water supplies, mills, dumps and mines

with the highest levels of radiation. During that time, more information was discovered about the scope of the problem and the work needed to be performed. A second 5-year plan, completed in 2013, outlined a multi-agency and multidisciplinary approach to assessing the sites to aid in the coordination of addressing cleanup activities at the sites.

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<sup>2</sup> The Hazard Ranking System is the principal mechanism that the EPA uses to place uncontrolled waste sites on the National Priorities List. It is a numerically based screening system that uses information from initial, limited investigations to assess the relative potential of sites to pose a threat to human health or the environment.

<sup>3</sup> The primary purpose of the Navajo AUM Project is to identify AUMs, potential exposures, and recommend methods to reduce exposure from AUMs on the Navajo Nation. The agencies involved are the EPA, Bureau of Indian Affairs, Nuclear Regulatory Commission, Department of Energy, and Indian Health Service.

## Prior Report

In May 2014, the U.S. Government Accountability Office (GAO) issued a report titled *Uranium Contamination: Overall Scope, Time Frame, and Cost Information Is Needed for Contamination Cleanup on the Navajo Reservation* (GAO-14-323). The report focused on findings related to the 2008 5-year plan. The report indicated that six of the plan's eight objectives were met. The GAO concluded that federal agencies had not identified the full scope of remaining work, timeframes or costs to fully address uranium contamination on or near Navajo lands. The GAO made four recommendations, including that the EPA Administrator; Secretaries of Energy, Interior, and Health and Human Services; and Chairman of the Nuclear Regulatory Commission develop a coordinated outreach strategy to include in the 2014 5-year plan and take action to incorporate key practices in their collaborative effort (including defining and agreeing on the agencies' respective roles and responsibilities). The federal agencies agreed with the recommendation and incorporated key practices in the 2014 5-year plan.

## Responsible Offices

EPA Region 6 (which covers New Mexico) and Region 9 (which covers Arizona) are responsible for addressing actions related to the cleanup of the Tronox Settlement-funded abandoned uranium mine sites, with Region 9 acting as the lead regional contact to Navajo Nation. None of the sites in our review were in Utah, so we did not include Region 8 in our review. At headquarters, the Office of Land and Emergency Management, Office of Enforcement and Compliance Assurance, Office of the Chief Financial Officer, and Office of International and Tribal Affairs have roles in the oversight of the AUM mines and EPA special account funds.

## Scope and Methodology

We conducted our audit from December 2017 to June 2018. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We analyzed documentation on AUMs and special accounts from EPA websites and those provided by Regions 6 and 9, such as the 5-year plans, Tronox AUM Proposed Mine Evaluation Risk Factors, Tronox Settlement Agreement, Tronox financial reports, and funding memos. We interviewed Regions 6 and 9 management and staff to understand the EPA's process for prioritizing Tronox Settlement-funded AUM sites and to determine the resource allocation methodology used for these sites. We interviewed members of the Navajo Nation to gain a stakeholder perspective.

## Results

The EPA does not yet have a prioritization methodology for cleaning up the Tronox AUM sites on or near Navajo Nation lands, but is developing one. In conjunction with stakeholders<sup>4</sup> involved in AUM cleanups, the EPA has developed a system for identifying immediate risks and, where necessary, has taken the removal actions needed. The EPA has been following the National Contingency Plan for assigning risk to the sites and is gathering the data needed to complete prioritization for all Tronox sites. The EPA is tracking the estimated cleanup costs, timeframe for cleanup, and scope of cleanup for the Tronox AUM sites where cleanup work has already been conducted. After the prioritization methodology is developed, the EPA will be able to develop a resource allocation methodology for the Tronox AUM sites based on estimated cleanup costs, timeframe for cleanup and scope of cleanup.

### ***EPA Is Developing a Prioritization Methodology for Tronox AUM Sites***

The EPA does not have a formal prioritization methodology for the cleanup of the Tronox AUM sites. According to EPA officials, they have been gathering the



EPA Region 9 staff in Arizona Cove and Red Valley areas in August 2017 working to determine most accessible roads to conduct removal site evaluations. (EPA photo)

necessary data and following the steps outlined in the National Contingency Plan to assess and eventually prioritize the Tronox sites. The EPA has implemented a “worst first” approach while proceeding through the development of the cleanup process. Prior to the Tronox settlement, the EPA used Airborne Spectral Photometric Environmental Collection Technology (ASPECT)<sup>5</sup> to gather information about contamination of the large affected area. The EPA was able to identify sites that were of higher risk to human health and the environment. The EPA initiated actions at sites where there was imminent danger.

In an effort to aide in prioritization prior to the Tronox settlement agreement, the EPA has been identifying site risk factors and grouping mines to

create a site ranking. The first procedure the agency used for prioritizing the Tronox mines was the Mine Category Assessment Protocol,<sup>6</sup> which according to the EPA, integrated information from prior scans by EPA and its contractors as well as the ASPECT over-flights and included criteria such as proximity, potential

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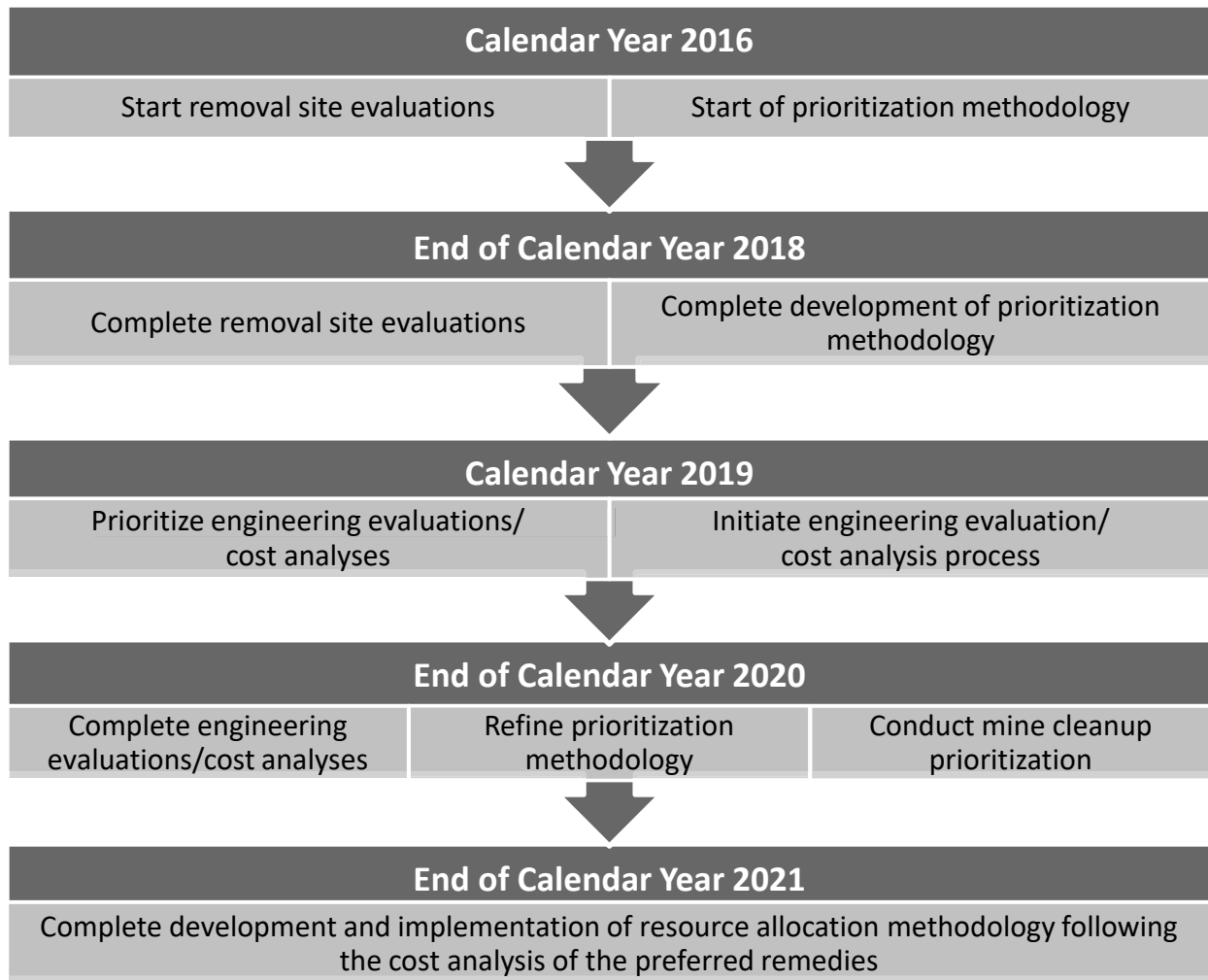
<sup>4</sup> Stakeholders include the Navajo Nation; states of Arizona and New Mexico; other federal agencies that are part of a national federal abandoned uranium mines cleanup group, such as the EPA, Department of the Interior and Department of Energy; and the public.

<sup>5</sup> ASPECT gamma survey collected data on uranium radioactivity levels in survey areas surrounding the AUMs.

<sup>6</sup> The Mine Category Assessment Protocol is used to develop a ranking system for prioritizing Removal Site Evaluations (see next footnote for definition).

human exposure and other risk factors. Following the protocol, the EPA is currently conducting the removal site evaluation<sup>7</sup> at the Tronox sites, after which the engineering evaluation/cost analysis<sup>8</sup> will be developed. Figure 1 provides a timeline of key activities during the next 4 years.

**Figure 1: Timeline for completion of prioritization and resource allocation methodologies**



Source: OIG image derived from EPA Region 9 data.

The prioritization methodology in development is being created with input from the Tronox stakeholders<sup>9</sup> and the Federal AUM Workgroup. Throughout its efforts in assessing the AUM sites and developing its plan for cleaning up the sites, the EPA has consulted with the Navajo Nation, consistent with EPA's 2011

<sup>7</sup> Removal site evaluations identify the source and nature of the release, evaluate the magnitude of the threat, and determine necessity of removal actions.

<sup>8</sup> Engineering evaluation/cost analyses analyze the ability to implement, and the cost and effectiveness, of various cleanup actions based on removal site evaluation data.

<sup>9</sup> Stakeholders include the Navajo Nation; state of New Mexico; and other federal agencies that are part of a national federal abandoned uranium mines cleanup group, such as the Department of the Interior and Department of Energy.

Policy on Consultation and Coordination with Indian Tribes. The EPA indicated it does not envision the final prioritization methodology being a list of sites in a numerical order but rather groupings of sites prioritized by highest to lowest risk.

***EPA Will Not Have a Resource Allocation Methodology for All Tronox Special Account Funds Until Prioritization Methodology Is Complete***

The EPA has not completed a resource allocation methodology for all of the Tronox AUM sites that accounts for estimated cleanup costs, timeframe for cleanup, and scope of cleanup. EPA officials said that they will not be able to fully develop this resource allocation methodology until the site prioritization is complete. However, the EPA is currently tracking the estimated cleanup costs, timeframe for cleanup, and scope of cleanup for the Tronox AUM sites where cleanup work has already been completed.

Regions 6 and 9 established a series of sub-accounts for individual sites/projects within the overall umbrella account that will be used to address the Navajo Area Uranium Mines. In April 2017, the EPA developed a “Tronox Navajo Area Uranium Mines Project Implementation Plan, Accounting Strategy” to manage, track, plan and communicate the use of the funds. EPA Region 6 uses a special account structure similar to EPA Region 9 to address the Tronox Navajo AUM sites in New Mexico. The accounts are tracked in the regions and headquarters through the Compass database and the Superfund Cost Recovery Package Imaging and On-Line System (known as “SCORPIOS”). The data obtained in those systems is presented in the EPA’s quarterly and annual reports.

The EPA (Regions 6 and 9), Navajo Nation, and New Mexico meet several times a year to discuss prioritizing response actions and the funding of projects at each Tronox AUM site. The parties develop a coordinated prioritized project list along with estimated funding requirements for the following calendar year. Individual project lists are tracked in an annual “Approval and Annual Funding Projections for Implementation of Tronox Settlement Memo.” Once projects are approved, a special account name/number is created for that project to track expenditures. Special account funds have been and will continue to be used for future cleanup actions needed to address sites that pose an imminent and substantial endangerment.

According to the EPA, the prioritization methodology is being developed to address all of the Tronox AUM sites. The EPA believes that prioritizations will be determined when the engineering evaluations/cost analyses are complete. The goals of the engineering evaluations/cost analyses are to identify the objectives of the cleanup and analyze the various alternatives that may be used to satisfy the objectives for cost effectiveness, and their ability to be implemented. Therefore, the EPA cannot provide a complete resource allocation methodology for all of the Tronox sites until completion of removal site evaluation and engineering evaluations/cost analyses.

## **Conclusion**

The agency has taken appropriate steps to assess sites, take removal actions when needed, and gather the data necessary to complete its assessments and develop its prioritization methodology. Regions 6 and 9 have agreed on a timeline to complete the key activities necessary to finalize their prioritization methodology. It is critical that the EPA meet its milestones and finalize the prioritization of Tronox AUM sites to use the Tronox special account effectively and provide continued protection of human health and the environment.

## **Recommendations**

We recommend that the EPA Regional Administrators, Regions 6 and 9:

1. Complete the necessary removal site evaluations and engineering evaluations/cost analyses.
2. Fully develop and implement prioritization and resource allocation methodologies for the Tronox abandoned uranium mine sites on or near Navajo Nation lands.

## **Agency Response and OIG Evaluation**

EPA Regions 6 and 9 agreed with the report's recommendations and offered technical comments in a response dated July 16, 2018. On July 30, 2018, the agency provided a revised email response to further address Recommendation 2. We revised the report as appropriate, based on the technical comments. In response to the recommendations, the regions provided acceptable corrective actions and planned completion dates, with corrective actions pending. Appendix A contains the agency's response to the discussion document, including the revised response.



## ***Status of Recommendations and Potential Monetary Benefits***

RECOMMENDATIONS						Potential Monetary Benefits (in \$000s)
Rec. No.	Page No.	Subject	Status <sup>1</sup>	Action Official	Planned Completion Date	
1	8	Complete the necessary removal site evaluations and engineering evaluations/cost analyses.	R	Regional Administrators, Regions 6 and 9	12/31/20	
2	8	Fully develop and implement prioritization and resource allocation methodologies for the Tronox abandoned uranium mine sites on or near Navajo Nation lands.	R	Regional Administrators, Regions 6 and 9	12/31/21	

<sup>1</sup> C = Corrective action completed.

R = Recommendation resolved with corrective action pending.

U = Recommendation unresolved with resolution efforts in progress.

## Agency Response to Discussion Document



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY


REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS TX 75202-2733


REGION IX  
75 HAWTHORNE STREET  
SAN FRANCISCO, CA 94105

JUL 16 2018

### MEMORANDUM

SUBJECT: Response to Office of Inspector General Discussion Document, "EPA Is Developing a Methodology to Prioritize Cleaning Up Abandoned Uranium Mine Sites on or Near Navajo Nation Lands," (Assignment # OPE-FY17-0023) dated June 15, 2018

FROM:  Anne Idsal  
Regional Administrator  
Region 6

 Michael Stoker  
Regional Administrator  
Region 9

TO: Kevin Christensen  
Assistant Inspector General  
Office of Audit and Evaluation  
Office of Inspector General

Thank you for the opportunity to respond to the issues and recommendations in the subject audit report. Following is a summary of the United States Environmental Protection Agency, Region 6 and 9's overall position, along with our position on the two report recommendations. For the report recommendations, we provide corrective actions and estimated completion dates to the extent possible. We also provide Region 6 and 9's detailed comments with respect to certain factual matters covered in the discussion document and a copy of comments from EPA's Office of Site Remediation Enforcement.

## I. AGENCY'S OVERALL POSITION

The U.S. Environmental Protection Agency, Regions 6 and 9, agree with the recommendations in the report.

## II. AGENCY'S RESPONSE TO REPORT RECOMMENDATIONS

### Agreements

No.	Recommendation	High-level Intended Corrective Actions	Estimated Completion
1.	Complete the necessary removal site evaluations and engineering evaluations/cost analyses.	1.1 Complete removal site evaluations (RSEs).	December 31, 2018
		1.2 Complete engineering evaluations/cost analyses.	December 31, 2020
2.	Fully develop and implement prioritization and resource allocation methodologies for the Tronox abandoned uranium mine sites on or near Navajo Nation lands.	1.1 Complete development of prioritization methodology.	December 31, 2018
		1.2 Refine prioritization methodology.	December 31, 2020
		1.3 Conduct mine cleanup prioritization.	December 31, 2020
		1.4 Complete development and implementation of resource allocation methodology following the cost analysis of the preferred remedies.	December 31, 2021

**OIG Note:** On July 30, 2018, action officials for Regions 6 and 9 provided a revised response to report Recommendation 2 by providing the above milestone highlighted in blue text and annotated as corrective action 1.4 with the corresponding estimated completion date.

Note: Regions 6 and 9 intend to follow through with our commitments and timeline (as we detailed above). However, completion dates are subject to available resources (staffing). As the OIG found (see <https://www.epa.gov/office-inspector-general/report-epas-distribution-superfund-human-resources-does-not-support-current>), both Regions 6 and 9 are operating at a structural deficit with regard to FTE. This lack of adequate resources could affect the actual completion dates.

## Disagreements

The U.S. Environmental Protection Agency, Regions 6 and 9, have no disagreements.

### III. DETAILED COMMENTS FROM REGIONS 6 AND 9

1. On Page 1, first paragraph, the draft indicates “On January 21, 2015, the EPA recovered almost \$1 billion from Tronox Incorporated.” To clarify the settlement history, there have been two separate settlements in the Tronox Bankruptcy that provided funding for the “Navajo Area Uranium Mines” (“NAUM”) (collectively “the Settlements”). The first settlement was with Tronox, Incorporated and provided approximately \$12 million. The second settlement was with Anadarko Petroleum Corporation, resolved fraudulent conveyance claims against Kerr-Mc-Gee Corporation and provided approximately \$890 million. Each of the Settlements also provided separate funding for the Quivira Mine Site, the largest of the Tronox uranium mines on the Navajo Nation (approximately \$1.2 million and \$89 million respectively). In total, the two settlements provided approximately \$990 million to address uranium mine sites formerly operated by Kerr McGee Corporation on and near the Navajo Nation.
2. On Page 1, Charles Huskon No. 7 Mine (EPA photo). This is not a Tronox mine. Attached please find a photo of the Tronox Mesa V Shaft and waste pile for possible use in the report.
3. On Page 1, first paragraph, the draft indicates “50 abandoned uranium mine sites.” There are currently 54 NAUMs funded by the Settlements. As noted above, funding for the Quivira Mine Site is completely separate and cannot be prioritized *vis a vis* the other NAUM sites.
4. On page 1, the second paragraph should reflect that the mines were operational until the 1980s.
5. On page 2, the second sentence should clarify that “Tronox Special Account funds [designated for specified uranium mine sites in or near Navajo Nation territory] can be used to support activities related to the assessment and cleanup at the approximately 54 mines and contamination caused by the mines.”
6. On Page 2, Tronox Settlement Agreements bullet #2, because contaminants other than radiation will be evaluated, we recommend the following change to bullet #2:
  - *Investigate the nature and extent of the contamination in water, soil, sediment and air.*
7. On Page 2, second paragraph, it should be noted that of the 54 NAUM sites covered by the funding in the Tronox Settlements, 20 are near the Navajo Nation on private land within New Mexico.

8. On Page 2, Impacts on Human Health and Environment from Uranium Contamination, the Regions recommend changing “unregulated water” to “contaminated water” for clarification.
9. On Page 5, first paragraph, the draft indicates “In conjunction with AUM cleanup stakeholders, the EPA has developed a system for identifying immediate risks and, where necessary, has taken the removal actions needed.” For clarification, it should read “In conjunction with stakeholders involved in AUM cleanups nationwide, the EPA has developed a system for identifying immediate risks and, where necessary, has taken the removal actions needed.”
10. On Page 5, EPA photo caption states “EPA Region 9 staff assessing Tronox mines in the Cove and Red Valley areas in August 2017 to determine most assessable roads to conduct removal site evaluations”. The caption should read “The EPA Region 9 staff is assessing Tronox mine roads in the Cove and Red Valley areas in August 2017 to determine most accessible roads to conduct removal site evaluations”.....
11. On Page 5, third paragraph – first sentence should include that ASPECT was used for prioritization:

*In an effort to aide in prioritization prior to the Tronox settlement agreement, the EPA has been identifying site risk factors and grouping mines to create a site ranking. The first procedure the agency used for prioritizing the Tronox mines was the Mine Category Assessment Protocol,<sup>5</sup> which integrated information from prior scans by EPA and its contractors as well as the ASPECT over-flights and included criteria such as.....*
12. On Page 6, second paragraph, Federal Uranium Mines Commission should be replaced with Federal AUM Workgroup.
13. On Page 7, third paragraph – the first sentence should include acknowledge that the prioritization methodology is being developed through collaboration and outreach to Navajo Nation and the State of New Mexico.
14. General Footnote Comment – stakeholders should include the public.

## ***Distribution***

The Administrator  
Deputy Administrator  
Chief of Staff  
Special Advisor, Office of the Administrator  
Assistant Administrator for Enforcement and Compliance Assurance  
Assistant Administrator for Land and Emergency Management  
Assistant Administrator for International and Tribal Affairs  
Agency Follow-Up Official (the CFO)  
Agency Follow-Up Coordinator  
General Counsel  
Associate Administrator for Congressional and Intergovernmental Relations  
Associate Administrator for Public Affairs  
Regional Administrator, Region 6  
Regional Administrator, Region 9  
Director, Office of Continuous Operations, Office of the Administrator  
Principal Deputy Assistant Administrator for Enforcement and Compliance Assurance  
Deputy Assistant Administrator for Enforcement and Compliance Assurance  
Deputy Assistant Administrator for International and Tribal Affairs  
Deputy Regional Administrator, Region 6  
Deputy Regional Administrator, Region 9  
Director, American Indian Environmental Office, Office of International and Tribal Affairs  
Audit Follow-Up Coordinator, Office of the Administrator  
Audit Follow-Up Coordinator, Office of Enforcement and Compliance Assurance  
Audit Follow-Up Coordinator, Office of International and Tribal Affairs  
Audit Follow-Up Coordinator, Region 6  
Audit Follow-Up Coordinator, Region 9





## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

December 29, 2020

### **MEMORANDUM**

**SUBJECT:** Update to Responses to Office of Inspector General June 15, 2018, Report Recommendations and August 22, 2018 (No. 18-P-0233) Report entitled "EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Nation Lands."

**FROM:** Ken McQueen  
Regional Administrator, Region 6

KENLEY  
MCQUEEN

Digitally signed by KENLEY MCQUEEN  
DN: c=US, o=U.S. Government, ou=Environmental  
Protection Agency, cn=KENLEY MCQUEEN,  
6.9.2342.19200300.100.1.1=68001001780283  
Date: 2020.12.29 08:49:27 -0600

John W. Busterud  
Regional Administrator, Region 9

JOHN  
BUSTERUD

Digitally signed by JOHN  
BUSTERUD  
Date: 2020.12.29  
08:13:54 -08'00'

**TO:** Kathlene Butler  
Acting Assistant Inspector General  
Office of Audit and Evaluation  
Office of Inspector General

The United States Environmental Protection Agency (EPA) is providing an update on its progress with the corrective actions identified in the report titled, "EPA Needs to Finish Prioritization and Resource Allocation Methodologies for Abandoned Uranium Mine Sites on or Near Navajo Nation Lands" and proposing a revised corrective action. The report focused on the 54 Tronox Navajo Area Uranium Mines (NAUMs) on the Navajo Reservation or on private land within the State of New Mexico which included 20 mine sites in Region 6 and 34 sites in Region 9. Corrective actions include completion of Engineering Evaluation and Cost Analysis (EE/CAs) for these sites and refining and finalizing a prioritization methodology for the Tronox settlement NAUM mine site cleanups. An updated table summarizing completed activities and activities that remain outstanding can be found in Attachment 1 at the end of this letter.

On September 2, 2020, EPA established a new office within the Office of Land and Emergency Management (OLEM) to improve efficient and effective cleanups at western hardrock mining sites. This office, called the Office of Mountains, Deserts and Plains, will serve as the coordinating body for cleanup efforts at western hardrock mine sites with EPA Regions 6, 7, 8, 9 and 10, OLEM and other headquarters offices. A special priority area for OMDP is to improve response actions and expedite the effective cleanup of abandoned uranium mines on the Navajo Nation. EPA recommends that further OIG inquiries be directed to EPA's OMDP. This office will serve as the EPA lead office for reporting progress and completion of EPA commitments to this report (No. 18-P-0233).

EPA has addressed thirty-five percent of the 54 sites by completing four draft final EE/CAs that cover the 18 mines on private land in Ambrosia Lake, New Mexico. An additional mine, Spencer Mine, was reclaimed by the State of New Mexico with funding by the Bureau of Land Management, and no further EPA action is planned for this site. EPA completed a draft EE/CA

for the Section 32 and 33 mine sites, which have commingled mine waste contamination and are located on Navajo allotment land. Region 9 will be the lead region for both Section 32 and Section 33, with Region 6 as the support region.

EPA also refined the prioritization methodology and completed scoring sheets to provide an initial relative ranking of the 54 sites under the Tronox settlement. EPA is sharing the draft final prioritization methodology with its stakeholders to include the State of New Mexico (NM Environment Department and NM Mining and Minerals Division) and the Navajo Nation (Navajo Nation EPA [NNEPA], Navajo AML, Navajo DOJ, and Navajo Office of the President and Vice President). No further EPA action is planned for the prioritization methodology beyond what is described below and in Table 1.

EPA will proceed with robust discussions with the Navajo Nation and the State of New Mexico to finalize EE/CAs for all remaining sites concurrently. The EE/CAs will provide critical information such as draft remedy options with associated scope and cost, practical engineering logistics considerations, and public review and comment processes associated with individual draft EE/CAs.

Of the 34 mines in Region 9, EPA did not complete the draft EE/CAs as planned this year due to a convergence of factors. The most significant of these factors was the ongoing COVID-19 pandemic, resulting in travel restrictions for EPA staff <sup>1</sup> and repeated closures of Navajo Nation government offices, making it impossible to conduct the fieldwork necessary to complete the draft EE/CAs.

To summarize completed actions and next steps:

- EPA refined the draft prioritization methodology and developed an initial prioritization of all 54 sites.
- EPA completed draft final EE/CAs for 18 NAUMs under the Tronox Settlement.
- By September 30, 2021, EPA Region 9 will complete draft EE/CAs for four sites closest to residents, and by December 31, 2021, Region 9 will complete draft EE/CAs for the remaining 30 sites.
- By December 31, 2021, EPA will finalize its prioritized list of 54 sites. EPA will continue to meet with the Navajo Nation and the State of New Mexico during this process.
- By December 31, 2021, OMDP, in partnership with the Navajo Nation, State of New Mexico, and Regions 6 and 9, will establish a short, medium and long term funding allocation strategy for the prioritized NAUM sites. The allocation strategy and funding will be reviewed annually.

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<sup>1</sup>As an update, Region 9 has recently posted three staff in the Navajo Nation and added four new Remedial Project Managers for NAUM cleanups.

The EPA appreciates the opportunity to report the progress made in addressing contaminated mines identified in the Tronox Settlement. OMDP looks forward to working with the OIG to clean up the Tronox NAUM mine sites in Regions 6 and 9.

cc: Deb Thomas, Acting Administrator, Region 8  
Shahid Mahmud, Acting Director, Office Mountains Deserts and Plains

Attachment

## Attachment 1 OIG Original Corrective Actions and Status

In 2018, Regions 6 and Region 9 committed to completing several corrective actions in order to finish prioritization and resource allocation for the Tronox NAUMs. Region 6 divided the 18 Tronox NAUMs on private land in Ambrosia Lake into 4 study areas to more efficiently manage the investigations. Region 9 identified 34 Tronox NAUM Mines. All dates below are subject to change if COVID-19 restrictions and/or if weather conditions delay the start of field work. OLEM's Office of Mountains, Deserts and Plains will play an active role in the corrective actions below in accordance with its mandate.

Original Corrective Actions and Status			
No.	Recommendation	High-level Intended Corrective Actions	Estimated Completion / Region 6 and 9 Completion Status
1.	Complete the necessary removal site evaluations and engineering evaluations/cost analyses.	1.1 Complete removal site evaluations (RSEs).	Region 6 and Region 9 – COMPLETED May 31, 2019
		1.2 Complete engineering evaluations/cost analyses (EE/CAs).	December 31, 2020  Region 6 --COMPLETED 4 Draft Final EECAs for 18 Tronox NAUMs  Region 9 – Draft 4 EE/CAs by September 30, 2021 at mines that are closest to residents, where exposure is higher, and human health risk is therefore potentially higher. Draft remaining EE/CAs by December 31, 2021
2.	Fully develop and implement prioritization and resource allocation methodologies for the Tronox abandoned uranium mine sites on or near Navajo Nation lands.	2.1 Complete development of prioritization methodology.	May 31, 2019 (COMPLETED)
		2.2 Refine prioritization methodology.	December 31, 2020  COMPLETED Draft Final July 2020
		2.3 Conduct mine cleanup prioritization.	December 31, 2020  Region 6 – COMPLETED Relative prioritizations for its 18 Tronox Mines October 30, 2020
			Region 9 – COMPLETED Relative prioritizations for the 34 Tronox Mines December 31, 2020.  Share relative prioritization methodology results with Navajo Superfund Program (NSP) and

			<p>State of New Mexico by January 15, 2021.</p> <p>Complete prioritization list for funding by December 31, 2021</p>
		<p>2.4 Complete development and implementation of resource allocation methodology following the cost analysis of the preferred remedies</p>	<p>Establish a funding allocation strategy for the prioritized NAUM sites by December 31, 2021</p> <p>Complete final resource allocations by May 31, 2022</p>

## Attachment 4

Tronox NAUM Cost Estimate Table

Category	Description			Cost
EPA Intramural	Federal Salary and Travel			\$98,000,000
EPA Extramural	Grants & Cooperative Agreements to Navajo Nation and New Mexico, Contractor Oversight Support, Post Removal Site Control			\$121,000,000
Region 6 Non-Time Critical Removal Actions	Non-Time Critical Removal Construction Costs	East GSA	\$213,000,000	\$669,000,000
		Central GSA	\$229,000,000	
		West GSA	\$209,000,000	
		Section 10	\$18,000,000	
Region 9 Interim & Non-Time Critical Removal Actions	Non-Time Critical Removal Construction Costs	Section 32/33	\$61,000,000	\$1,034,000,000
		Lukachukai	\$128,000,000	
		Tse Tah\Cove	\$845,000,000	
Total Estimated Funding Needs				\$1.922,000,000



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6 **IN THE UNITED STATES DISTRICT COURT**  
7 **FOR THE DISTRICT OF ARIZONA**  
8

9 El Paso Natural Gas Company, LLC,

10 Plaintiff,

11 v.

12 United States of America, et al.,

13 Defendants.  
14  
15

No. CV14-8165-PCT-DGC

**ORDER**

16 This case concerns environmental liability under the Comprehensive Environmental  
17 Response, Compensation, and Liability Act (“CERCLA”) for 19 uranium mines located  
18 near Cameron, Arizona, on the Navajo Nation Reservation (the “Mine Sites”). Plaintiff  
19 El Paso Natural Gas Company, LLC, whose predecessors operated the mines in the 1950s  
20 and 1960s, brings claims against Defendants United States of America, the Department of  
21 the Interior (“DOI”), the Bureau of Indian Affairs (“BIA”), the United States Geological  
22 Survey (“USGS”), and the Department of Energy (“DOE”) (collectively, the “United  
23 States”) for cost recovery and contribution. Doc. 55 ¶¶ 1-2.<sup>1</sup> The United States asserts a  
24 CERCLA counterclaim against El Paso for contribution. Docs. 53, 66.<sup>2</sup>  
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26 <sup>1</sup> The Nuclear Regulatory Commission was dismissed on May 5, 2016. *See* Doc. 72.

27 <sup>2</sup> The 19 Mine Sites consist of sites 1-12, 14, and 17, originally permitted by Charles  
28 and Evan Huskon, and sites 20-22 and 24, originally permitted by Rare Metals Corporation.  
The Court will refer to the sites generally as “Mine Sites” and specifically as “Huskon”  
followed by the site number or “Ramco” (for Rare Metals) followed by the site number.

1 El Paso stipulates that it was an operator of the Mine Sites for purposes of CERCLA  
 2 liability (Doc. 108), and the Court previously held that the United States is liable as an  
 3 owner of the land where the mines are located (Doc. 135). The parties assert additional  
 4 grounds for CERCLA liability against each other and ask the Court to make an equitable  
 5 allocation of past and future response costs under CERCLA § 113.

6 The Court held an eight-day bench trial in February and March, 2019. Each side  
 7 presented many witnesses, live or by deposition, and hundreds of exhibits. The parties also  
 8 submitted extensive proposed findings of fact and conclusions of law, as well as post-trial  
 9 briefing on specific issues addressed in this order. For reasons set forth below, the Court  
 10 will allocate 65% of past and future response costs to El Paso and 35% of such costs to the  
 11 United States.

## 12 **I. Findings of Fact.**

13 This order sets forth the Court's findings of fact and conclusions of law under  
 14 Rule 52 of the Federal Rules of Civil Procedure. The Court provides some citations to the  
 15 record, but the citations should not be regarded as the sole basis for the Court's ruling. The  
 16 Court's findings and conclusions are based on all of the testimony and exhibits admitted in  
 17 evidence.

### 18 **A. The Parties.**

19 El Paso is the corporate successor of Arrowhead Uranium Company ("Arrowhead"),  
 20 Rare Metals Corporation of America ("Rare Metals"), and El Paso Natural Gas Company.  
 21 Doc. 159 at 8.<sup>3</sup> Arrowhead and Rare Metals mined uranium at the Mine Sites. Arrowhead  
 22 was one of the original uranium mining companies in the Cameron region of Northern  
 23 Arizona, operating from 1952 to 1954. Ex. 28 at 7-8. Rare Metals was formed in 1954 to  
 24 prospect, explore, and acquire properties containing uranium deposits and other valuable  
 25 minerals. Rare Metals acquired Arrowhead in December 1954 and took over its uranium  
 26 mining operations. *See* Exs. 1040-44. Rare Metals also engaged in uranium exploration  
 27

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28 <sup>3</sup> Throughout this order, the Court will refer to Arrowhead, Rare Metals, and El Paso collectively as "El Paso" unless the context requires identification of a specific entity.

1 and development in Utah, New Mexico, California, and other locations. Exs. 1041 at 7;  
 2 1042 at 6, 8; 1043 at 5-7, 9. Rare Metals merged with El Paso in 1962. Ex. 1056. El Paso  
 3 also takes responsibility for the mining activities of Cameron Mining Company at several  
 4 of the Mine Sites. Doc. 159 at 8.

5 The land where the Mine Sites are located is owned by the United States in trust for  
 6 the Navajo Nation. *See* 25 U.S.C. § 640d-9(a); Doc. 159 at 7. The DOI and the BIA, as  
 7 part of their tribal trust responsibilities, oversaw some aspects of the mining permits and  
 8 leases for the Nation. Doc. 159 at 8; Ex. 12 at 2. The USGS, which is part of the DOI,  
 9 collects, analyzes, monitors, and provides information about natural resources. Docs. 1  
 10 ¶ 19; 23 ¶ 19. DOE is the successor agency to the former Atomic Energy Commission  
 11 (“AEC”). Doc. 23 ¶ 20. After World War II, the AEC was responsible for creating and  
 12 managing a program to procure uranium for nuclear weapons, known as the Domestic  
 13 Uranium Procurement Program (“DUPP”). Ex. 74 at 6.

#### 14 **B. The Cold War and the Domestic Uranium Industry.**

15 The United States’ use of atomic bombs in Japan both hastened the end of World  
 16 War II and sparked the Cold War with the Soviet Union. Both nations aggressively  
 17 developed nuclear weapons. Obtaining uranium, a naturally occurring metal that was an  
 18 indispensable component of such weapons, became a driving objective of the United  
 19 States’ national defense effort. Doc. 158 ¶ 12.

20 In 1946, Congress passed the Atomic Energy Act, which formed the AEC. *See* 60  
 21 Stat. 755. The Act also established the DUPP, a program for “the production, ownership,  
 22 and use of fissionable material to assure the common defense and security and to insure  
 23 the broadest possible mining of the fields.” Ex. 74 at 6. Viewing foreign sources of  
 24 uranium as unreliable, the United States sought, through the DUPP, to locate and develop  
 25 domestic sources using a combination of government-led exploration and private enterprise  
 26 incentives. Tr. at 94-95. At the time, the federal government was the only authorized  
 27 purchaser of uranium in the United States. Atomic Energy Act of 1946 § 5(2); Ex. 74 at 14.

1           Between 1948 and 1956, the AEC published nine circulars offering guaranteed  
2           minimum prices and bonus payments for uranium ore (the “Circulars”). *See* Ex. 41.  
3           Circulars 3, 4, 5, and 6 applied to uranium mining on the Colorado Plateau, a geographic  
4           area encompassing some 140,000 square miles in Arizona, Utah, Colorado, and New  
5           Mexico. Ex. 1002; Doc. 159 at 7. Circular 3 guaranteed, for three years, a minimum price  
6           and “development allowance” of fifty cents per pound for uranium ore of .15% grade or  
7           more. Ex. 41 at 3-4; *see also id.* at 8-9 (Circular 5 Revised). Circular 4 established a  
8           haulage allowance of six cents per mile for the first 100 miles. *Id.* at 5. Circular 5 also  
9           guaranteed a minimum price and expanded the development allowance to ore with uranium  
10          concentrations as low as .10%. *Id.* at 6. Circular 6 created an additional bonus for the  
11          production of uranium ore from new domestic mines. *Id.* at 13-14.

12          The AEC assisted the young domestic uranium industry by conducting geologic  
13          surveys, furnishing free testing and assaying services, and agreeing to purchase uranium  
14          ore. Ex. 25 at 13. The AEC established ore-buying stations in uranium-producing areas.  
15          *Id.* The AEC’s assistance programs included research and development that led to  
16          improvement in milling processes and other mining-related innovations. *Id.*; *see also*  
17          Chenoweth Depo. Jan. 15, 2014, at 85.<sup>4</sup>

18          Beginning in 1948, the AEC, assisted by the USGS, operated a program of uranium  
19          exploration on the Colorado Plateau and several other western states. Ex. 25 at 14. The  
20          program involved temporary withdrawal of some 700 square miles of public domain land  
21          for exploration, geologic studies, drilling, examination of samples, and airborne  
22          reconnaissance. *Id.* The AEC employed a contractor, Walker Lybarger, to use a bulldozer  
23          to uncover any uranium outcrops that were discovered. Chenoweth Depo. Jan. 15, 2014,  
24          at 103.<sup>5</sup> Ore found on AEC land was leased to private parties directly through the AEC in  
25          return for a royalty on ore production. Ex. 25 at 14; *see also* Chenoweth Depo. Jan. 15,

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26  
27          <sup>4</sup> The relevancy and Rule 403 objections to this deposition testimony are overruled.  
28          When the Court relies on any other deposition testimony submitted by the parties to which  
        an objection has been made, the Court will state its ruling in this order.

<sup>5</sup> The Rule 403, 602, and 802 objections to this deposition testimony are overruled.

1 2014, at 79-82. The AEC also undertook an access road program under which the AEC,  
2 the Bureau of Public Roads, and various state agencies improved over 1,200 miles of roads  
3 in Arizona and other states to facilitate uranium exploration and mine development. Ex. 25  
4 at 15.

5 In July 1952, Charles Steen, an independent prospector, found uranium on the  
6 Colorado Plateau south of Moab, Utah. *See* Tr. at 56-57, 1600. Steen made over a million  
7 dollars on the ore deposit, and his success motivated many others to pursue uranium  
8 mining, launching a gold-rush-like interest in prospecting for uranium. Tr. at 57.

9 **C. Uranium Mining on the Navajo Reservation.**

10 Because the 19 Mine Sites are all located on the Navajo Reservation, both the  
11 Navajo Nation and the federal government were involved in transactions affecting the sites.  
12 Generally, four permits or leases are required for uranium mining: (1) prospecting permits,  
13 (2) drilling and exploration permits, (3) mining permits, and (4) mining leases. *See* Ex. 31  
14 at 10. As of 1951, the Navajo Nation did not require a separate drilling and exploration  
15 permit (Ex. 1075) and required only non-Navajos to apply for prospecting permits (Ex. 31  
16 at 10). In 1953, the Nation's mining regulations were updated to require drilling and  
17 exploration permits. Ex. 1078. The new regulations also required any prospector, Navajo  
18 or non-Navajo, to apply for a prospecting permit. *Id.* at 2. A non-Navajo permit holder  
19 could negotiate a mining lease with a tribal advisory committee. *Id.*

20 Permits were approved by the Navajo Tribal Council and the area director of the  
21 BIA. *See* Tr. at 160-61; *see, e.g.*, Ex. 294A. All rents and royalties were paid to the United  
22 States Treasury for deposit exclusively in Navajo tribal funds. *See* Tr. at 203, 523. The  
23 permits contained provisions related to the trust oversight responsibilities of the DOI and  
24 required permittees to (1) "conform to any and all regulations of the Secretary of the  
25 Interior"; (2) receive approval from the Tribal Council and the Secretary of the Interior  
26 before assigning the permit; and (3) allow inspection of permitted premises and operations  
27 by BIA personnel. Ex. 294A at 3-4. These provisions and the DOI oversight of the leases  
28 were consistent with the DOI's trust duties over all reservation mining. *See* Tr. at 162-63,

1 90 (the lease authorization requirement is consistent with all mining contracts on the  
2 Navajo reservation); Ex. 75 (example of a lease rejected by the BIA consistent with its  
3 tribal trust duty); Ex. 13 (delegating approval of leases to the Secretary of the Interior  
4 because it was in a better position to make profitable lease arrangements for tribes); *see*  
5 *also Navajo Tribe of Indians v. United States*, 9 Ct. Cl. 227, 232 (1985) (noting that the  
6 United States has a responsibility to supervise the affairs of Indian tribes). The Navajo  
7 Nation exercised independent decision-making authority and had a strong interest in  
8 developing uranium resources on tribal lands, and that the United States supported the  
9 Nation's efforts consistent with its role as tribal trustee. Tr. at 893-95, 899-904, 941-42,  
10 988-89.

11 **D. The Mine Sites.**

12 In 1952, Charles Huskon, a Navajo prospector who worked for AEC contractor  
13 Walker Lybarger, discovered a natural uranium outcrop that would later become Huskon 1.  
14 Ex. 28 at 6. In July 1952, Huskon and his son left the contractor to work for Arrowhead.  
15 *Id.* In August and September, 1952, Huskon received mining permits for Huskon 1, 2, 3,  
16 4, 5, 6, 7, and 8, and assigned them to Arrowhead. Ex. 294D. In Apr. 1953, the BIA  
17 approved a mining permit for Huskon 9, 10, and 11, which Huskon also assigned to  
18 Arrowhead. Ex. 24 at 53. Huskon 12, 14, and 17 were surveyed and located in December  
19 1953 and January 1954 (Tr. at 525-27; Ex. 1023), but permits were not obtained until  
20 March 1954 (Ex. 294D).

21 Rare Metals acquired Arrowhead in December 1954 and took over all of its uranium  
22 mining operations. *See* Exs. 1040-44. In 1955, mining permits for Ramco 20, 21, and 22  
23 were issued to Navajo prospectors and assigned to Rare Metals. Ex. 294D. These sites  
24 were converted to mining leases in 1959. *Id.* Ramco 24 was permitted by a Navajo  
25 prospector in 1957 and assigned to Rare Metals. *Id.*

26 In 1959, Rare Metals allowed Cameron Mining Company, an independent  
27 contractor, to perform mining operations at sites where Rare Metals had ceased operations.  
28 Doc. 159 at 8; Tr. at 499-500. These included Huskon 1, 2, 3, 6, 10, 11, 12, and 17, and

1 Ramco 20, 21, and 22. Exs. 28 at 13; 1165; 1166; Prince Depo. Oct. 9, 1996, at 88-89.  
2 Rare Metals relinquished its rights to Ramco 24 in 1958, and its rights to the remaining  
3 Mine Sites during the first half of the 1960s. *See* Ex. 294D.

4 **E. Three Mining Phases.**

5 At trial and in their briefs, the parties focused on three phases of mine operations:  
6 exploration, mining, and reclamation. The Court makes the following findings of fact with  
7 respect to each phase.

8 **1. Exploration.**

9 During exploration, an ore deposit is located through prospecting, confirmed, and  
10 uncovered to determine its “dimension, grade, and continuity.” Tr. at 216. Common  
11 exploration methods in the 1950s included drilling and rim stripping. Tr. at 282. El Paso  
12 concedes that there is no evidence the United States ever conducted exploration activities  
13 at the Ramco sites (Tr. at 62), and El Paso does not seek contribution for exploratory  
14 drilling that occurred at any of the Huskon mines (Tr. at 17). During trial, El Paso also  
15 stated that it would assume responsibility for all exploration activities at Huskon 5, 6,  
16 and 9. Tr. at 348-49. This order, therefore, focuses on exploration at Huskon 1, 2, 3, 4, 7,  
17 8, 10, 11, 12, 14, and 17. El Paso claims that the United States engaged in rim stripping at  
18 each of these sites. The United States disagrees.

19 Rim stripping occurs when a bulldozer excavates soil, referred to as “overburden,”  
20 from the top of an ore deposit to expose the mineralized zone. *See* Tr. at 350. During a  
21 45-day period between December 19, 1953 and February 3, 1954, the AEC conducted rim  
22 stripping in the Cameron area. Exs. 58; 91 at 2; 129 at 20; 1258. According to a report  
23 prepared in 1955 by David Hinckley, an AEC geologist (the “Hinckley Report”), the AEC  
24 stripped approximately 45,000 linear feet of soil in the Cameron area during this 45-day  
25 window, exposing portions of 15 uranium outcrops. Ex. 129 at 20.

26 Exploratory trenches made during rim stripping can still be seen at many of the Mine  
27 Sites today. Some of the trenches are visible in aerial photographs of the sites taken in  
28



1 1954, and even more are apparent in aerial photographs taken in 1992. The question is  
2 who made the trenches.

3 AEC and its contractors used a Caterpillar D7 bulldozer for rim stripping – an 11-ton  
4 machine that cut a 29-foot-wide swath with its front blade. *See* Tr. at 330-31; Ex. 129 at  
5 20. Arrowhead did not own a machine of this size, but instead used a much smaller Allis  
6 Chalmers HD5 front-end loader for work at the Mine Sites. *See* Tr. at 320-22, 441; *see*  
7 *also* Maloney Depo. at 117. After it purchased Arrowhead in December 1954, Rare Metals  
8 also used D7 bulldozers, as well as larger D8s, for work at the Huskon Mine Sites. *See* Tr.  
9 at 542, 551 (Mr. Beahm testifying that there is no dispute that Rare Metals bulldozers were  
10 used at the Huskon mines), 1306 (1992 aerial photos suggest that more rim stripping  
11 occurred after 1954); Exs. 130 at 6; 1160 (1957 contract with Rare Metals for contractor  
12 stripping of overburden); *see also* Chenoweth Depo. Apr. 24, 2014, at 26 (more exploration  
13 by private parties after 1956 than by the AEC before 1956).

14 El Paso's mining expert, Douglas Beahm, reviewed historical documents regarding  
15 the DUPP and historical aerial photographs. Tr. at 311. He visited the Mine Sites six  
16 times. *Id.* On the basis of his investigation, Mr. Beahm testified that the AEC performed  
17 rim stripping at Huskon 1-12, 14, and 17. Tr. at 349.<sup>6</sup> He testified to measuring a total of  
18 30.2 acres (or 45,362 linear feet) of exploration disturbance at these Huskon sites. Tr.  
19 at 358-59. He noted that trenches he observed generally were 29-feet wide, corresponding  
20 to the size of a D7 blade, and that his estimated 45,362 linear feet of trenching aligns with  
21 the 45,000 linear feet of AEC rim stripping described in the 1955 Hinckley Report – rim  
22 stripping performed by the AEC during the 45-day window in 1953 and 1954. Tr. at 358;  
23 *see also* Ex. 129 at 20. Mr. Beahm concludes that all of the AEC's rim stripping in the  
24 Cameron area was performed at the Huskon Mine Sites, and constitutes the only rim  
25 stripping that occurred at those sites. El Paso also presented an undated internal corporate

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26  
27 <sup>6</sup> Mr. Beahm also noted a disturbance at Huskon 26, but he combined Huskon 26  
28 with Huskon 11. *See* Tr. at 349. Thus, Mr. Beahm's numbers are applicable to all 15  
Huskon sites.



1 memorandum which stated that the AEC bulldozed trenches on Huskon 1-11, 12, 14, and  
2 17, and that the company did “[l]ittle bulldozer work . . . except to strip off overburden.”  
3 Ex. 119; *see also* Tr. at 366-67.<sup>7</sup>

4 If Mr. Beahm is correct in his conclusion that some 45,000 feet of trenching was  
5 done by the AEC at the Mines Sites during the 45-day period described by Hinkley, the  
6 trenching would have occurred before the 1954 aerial photos were taken in February 1954  
7 and presumably would be visible in those photos. But the government’s aerial photography  
8 expert, Mary Sitton, testified that only 13,589 linear feet of rim stripping can be seen within  
9 the Mine Sites’ boundaries in the 1954 aerial photographs, with approximately 3,000 linear  
10 feet outside of the boundaries. *See* Tr. at 1116.<sup>8</sup> She identified many trenches visible at  
11 the sites today that cannot be seen in the 1954 aerial photographs. She also noted that the  
12 1955 Hinckley Report attributes the 45,000 linear feet of rim stripping not to the Mine Sites  
13 specifically, but to the general Cameron area, which includes scores of mine sites, and that  
14 Rare Metals had heavy bulldozers at the Mine Sites in early 1955 and thereafter – machines  
15 capable of creating the trenches observed on the ground today. This evidence persuasively  
16 suggests that the trenches at Huskon 1-12, 14, and 17 were not all made by the AEC during  
17 a single 45-day period in late 1953 and early 1954.

18 The Court finds Ms. Sitton’s testimony about the aerial photographs to be more  
19 credible than Mr. Beahm’s. She has significantly more aerial photography training and  
20 expertise than he does, and she obtained aerial photographs from the National Archives  
21 and Records Administration, the USGS, and the University of Arizona. Tr. at 1075. Unlike  
22 Mr. Beahm, she reviewed the historical aerial photos through a stereoscope, which allowed  
23 her to examine them in 3D. Tr. at 1076. The Court does not find credible Mr. Beahm’s

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24  
25 <sup>7</sup> El Paso presented evidence of some AEC involvement and reconnaissance in the  
26 Cameron area that predates Arrowhead’s mining permits, but it does not specifically refer  
to rim stripping. *See* Ex. 179 (sampling at Huskon 1 on September 9, 1952, three weeks  
before Arrowhead received its permit).

27 <sup>8</sup> Mr. Beahm’s exploration numbers included several areas outside of the mine  
28 boundaries. *See* Tr. at 617-18. According to El Paso, the EPA specifically requested that  
it examine these locations, but El Paso has not agreed to do any further remediation there.  
Tr. 438-41.

1 assertion that virtually all of the trenches seen on the ground today were present in 1954  
2 but do not appear in the 1954 aerial photographs because they were obscured by shadows  
3 or lack of contrast.

4 The evidence also shows that Arrowhead conducted rim stripping. Mr. Beahm  
5 testified that Arrowhead was unable to rim strip by bulldozer because it owned only the  
6 HD5 front-end loader, which was incapable of creating the wide trenches observed at the  
7 19 Mine Sites. *See* Tr. at 320-22, 441; *see also* Maloney Depo. at 117. And records do  
8 indicate that Arrowhead was primarily a hand-digging operation before it was acquired by  
9 Rare Metals. *See* Tr. at 323. Further, Dozing with an HD5 front-end loader would require  
10 multiple passes to create a trench as wide as a D7's, would create several separate waste  
11 piles, and would not create uniform windrows as observed on the side of trenches at the  
12 Mine Sites.<sup>9</sup> But the United States presented evidence that Arrowhead did conduct rim  
13 stripping with its HD5 at some of the Mine Sites. Arrowhead cofounder George  
14 Morehouse stated that he would "strip down with the dozer, actually [he would use] the  
15 front end loader as a dozer." *See* Ex. 69 at 9; *see also* Tr. at 1196-97. Expense and  
16 production reports for the Huskon sites, before the 45-day AEC exploration window, also  
17 indicate that rim stripping was performed by Arrowhead at the Huskon sites. *See* Ex. 1139  
18 (report for Huskon 1 for October 24, 1952 to March 31, 1953, stating cubic yards for  
19 stripping); 1106 at 6 (indicating that overburden was stripped by an ACD5, which is the  
20 Allis Chalmers HD5 dozer); *see also* Tr. at 1199.

21 Based on all the evidence, the Court makes several findings regarding the parties'  
22 involvement in the exploration phase.

23 First, El Paso was directly involved in exploration. It has assumed responsibility  
24 for all exploration activities at the Ramco sites and Huskon 5, 6, and 9, as well as all  
25 exploratory drilling. The evidence described above shows that Arrowhead engaged in rim  
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27 <sup>9</sup> A windrow is waste material left on either side of a trench dug by a bulldozer, or  
28 on one side if the bulldozer's blade is angled. Tr. 332.

1 stripping, and Arrowhead had mining permits at Huskon 1-11 before February 1954. *See*  
2 Ex. 294D. The parties agree that Arrowhead had the authority to mine or explore as a result  
3 of those permits. *See* Tr. at 1623. In fact, Arrowhead delivered its first uranium ore  
4 shipment from Huskon 1 in October 1952, well before the 45-day window when the United  
5 States conducted rim stripping activities in the Cameron area. *See* Ex. 28 at 7-8. The Court  
6 finds it likely that the rim stripping at Huskon 1-11 was conducted by Arrowhead in  
7 conjunction with its mining activities. *See* Tr. at 1099 (noting that exploration and mining  
8 occurred at the same time), 1228 (stripping is done at the mines after mining started).<sup>10</sup>

9 Second, the Court finds by a preponderance of the evidence that the United States  
10 engaged in exploration activities at Huskon 12, 14, and 17. Arrowhead did not receive a  
11 permit to mine these sites until March 1954, and yet Ms. Sitton and Mr. Beahm each found  
12 disturbances on these sites in the 1954 aerial photos that predate the permits. *See* Ex. 294D.  
13 For Huskon 14 and 17, Ms. Sitton noted several linear excavations on the 1954 aerials. *See*  
14 Exs. 1354; 1356.

15 El Paso asserts that Arrowhead could not have created these disturbances without a  
16 mining permit. *See* Tr. at 1623. Prior to approval of the survey of the mining claims,  
17 Arrowhead had no privileges at Huskon 12, 14, and 17. *See* Tr. at 369. El Paso argues that  
18 the United States did have permission from the Navajo Nation to prospect and explore on  
19 the lands in question before the February 1954 aerials were taken. Tr. at 341-43; Exs. 58;  
20 1258. The United States appears to argue that because Arrowhead had a prospecting  
21 permit, and because it surveyed and plotted Huskon 12, 14, and 17 in December of 1953

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22 <sup>10</sup> It is also possible that some exploration activities at Huskon 1-11 were conducted  
23 by the United States. The AEC certainly conducted rim stripping in the Cameron area, at  
24 least in the vicinity of the Mine Sites. *See* Exs. 91; 129 at 20. But the Court is not certain  
25 how much, if any, occurred on Huskon 1-11. El Paso's only historical document linking  
26 AEC exploration to Huskon 1-11 is the undated internal memo that does not identify the  
27 source of its information. *See* Ex. 119. And even if the United States conducted additional  
28 rim stripping at these sites, it would not affect the Court's allocation. The exploration  
phase of this case is small compared to the mining phase, and El Paso would, in any event,  
have welcomed and encouraged AEC rim stripping for more ore at its Mine Sites.

1 and January 1954, Arrowhead had authority to conduct exploration activities on those  
2 Sites. *See* Tr. at 1621. The United States asserts that because the Navajo Nation did not  
3 utilize exploration and drilling permits at the time, the prospecting permit gave Arrowhead  
4 authority to conduct these exploration activities. *See* Tr. at 1623. Further, the United States  
5 argues that the minimal level of activity identified by Ms. Sitton would be consistent with  
6 staking a mine claim. Tr. at 1622.

7 As already noted, the Navajo Nation initially did not require exploration or drilling  
8 permits. Tr. at 896, 1255; Exs. 1075; 1078. Miners applied for a prospecting permit and  
9 then for a mining permit. Ex. 1075. In December 1953, the Nation updated its regulations,  
10 requiring miners to seek first a prospecting permit, then an exploration permit, and then a  
11 mining permit. Tr. at 896; Ex. 1078. Mr. Beahm testified that the mining permit was  
12 necessary for miners to conduct exploration activities like those seen clearly at Huskon 14  
13 and 17, and that likely occurred at Huskon 12 (Tr. at 117), and the United States failed to  
14 present any testimony that supports its theory that a prospecting permit prior to 1953 would  
15 allow Arrowhead to conduct exploration.<sup>11</sup> Moreover, the fact that the disturbances in  
16 question were labeled as linear excavations or seemed to be made by heavy equipment  
17 indicates that these disturbances were not made in the normal course of staking a claim.  
18 *See* Trial Tr at 1176 (only use a simple compass and steel chain for staking claims).  
19 Because the trenches and disturbances at Huskon 12, 14, and 17 were made at a time when  
20 Arrowhead likely did not have authority to do the work, and were made by heavy  
21 equipment of the kind operated by the AEC contractor, the Court finds by a preponderance  
22 of the evidence that the United States conducted rim stripping at these sites.

23 Third, the Court does not find, as El Paso suggests, that the AEC conducted most of  
24 the exploration activities at the Mine Sites. Mr. Beahm relied heavily on current site visits  
25 where he assumed that bulldozer-sized trenches visible on the ground were made by the  
26

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27 <sup>11</sup> United States witness Jay Brigham testified that an individual with a prospecting  
28 permit would have an interest in the particular area. *See* Tr. at 944. But that does not mean  
that the individual would have had the authority to conduct exploration activities or to  
exclude the United States from conducting exploration activities.

1 AEC during the 45-day window in late 1953 and early 1954. But this view disregards the  
 2 fact that the disturbances could have been made at any time during the years of mining by  
 3 El Paso, including after 1954 when Rare Metals brought its own D7 and D8 bulldozers to  
 4 the Mine Sites. *See* Tr. at 390; Ex. 1158. Mr. Beahm also relied on historical documents  
 5 noting that the AEC conducted rim stripping in the Cameron area, but these documents  
 6 refer to the entire Cameron area, which contained approximately 100 mines. Tr. at 1147  
 7 (Ms. Sitton testifying that she noted other activity in the Cameron area), 1112-14  
 8 (discussing mapping anomalies that included linear excavations in the Cameron area  
 9 outside the Mine Sites), 1114-15 (Ms. Sitton testifying that the 45,000 linear feet does not  
 10 cover just the 19 Mine Sites); *see also* Ex. 1363. And Mr. Beahm's assertion that he  
 11 measured approximately 45,000 linear feet of trenching, which matched the Hinckley  
 12 Report on AEC activity, is less credible than Ms. Sitton's testimony that most of this  
 13 trenching does not appear in the 1954 aerial photographs.

14 In summary, although the Court finds that both El Paso and the United States  
 15 engaged in exploration activities at the Mine Sites, the Court does not find that all or even  
 16 a majority of it was performed by the United States. The evidence does not enable the  
 17 Court to precisely determine the parties' respective exploration activities at the sites, but  
 18 this is not an impediment to an overall allocation because the exploration phase is a  
 19 relatively minor portion of the relevant activity in this case.

## 20 **2. Mining.**

21 All of the Mine Sites were open pit mines. Tr. at 1611. They were mined either by  
 22 El Paso or one of the orphan companies. The United States never mined or supervised  
 23 mining operations at any of the sites. *See* Tr. at 908, 1580; Ex. 69 at 4-5; Chenoweth Depo.  
 24 Jan. 16, 2014, at 409; Chenoweth Depo. Apr. 24, 2014, at 23, 57.<sup>12</sup>

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25  
 26 <sup>12</sup> An orphan under CERCLA is a "party otherwise qualifying as a responsible party  
 27 [but who ] may be defunct, bankrupt, uninsured, or otherwise lack the resources to bear its  
 28 ideal measure of responsibility in monetary terms." *United States v Kramer*, 953 F. Supp.  
 592, 595 (D.N.J. 1997). There were five entities that operated the Mine Sites and  
 eventually went bankrupt: Utco Uranium, Cameron Mining, B.C. Associates, Domino  
 Company, and H.R. Rodgers. *See* Tr. at 743.

1           The Navajo Nation managed uranium mining on the reservation. Tr. at 941-42;  
2   Chenoweth Depo. Jan. 16, 2014, at 408-09. The Nation wrote its own regulations,  
3   established a department of mining, conducted mining inspections, and hired a mining  
4   engineer. Tr. 893-95; Exs. 31 at 8; 62; 1074; 1080. The United States did conduct  
5   inspections through the DOI and the Bureau of Mines (“BOM”) to promote mine safety  
6   and identify hazards. *See, e.g.*, Exs. 1189-1202; 1207-08; Chenoweth Depo. Jan. 16, 2014,  
7   at 409.

8           Initially, Arrowhead mined with picks, shovels, wheel barrows, the HD5 loader, and  
9   a crew of about twelve workers. *See* Ex. 69 at 10. El Paso’s proposed findings of fact  
10   admit that Arrowhead produced almost 4,000 tons of ore in 1953 and more than 8,000 tons  
11   in 1954. *See* Doc. 158 ¶ 167. When Rare Metals acquired Arrowhead in December 1954,  
12   production at the mines increased significantly. *See* Doc. 158 ¶ 167; Ex. 1334. In 1956,  
13   Rare Metals Mines produced nearly 30,000 tons of ore. *See* Doc. 158 ¶ 167. In 1957, the  
14   Mines Sites produced over 40,000 tons. Doc. 158 ¶ 167. As of March 1956, an internal  
15   company memo stated that Rare Metals had stripped 291,169 tons of native material at the  
16   Huskon sites and another 273,857 tons of overburden at the Ramco sites. Ex. 1135.

17           Open pit mines are created by stripping away large amounts of overburden and then  
18   removing the ore to an onsite stockpile. *See* Exs. 1190-1210 (safety inspection reports  
19   documenting mining methods). El Paso’s excavations at the Mine Sites ranged in size from  
20   shallow trenches to large pits up to 2,400 feet long. Exs. 28 at 5; 1190-1210; *see also*  
21   Tr. at 1202. Mine development also included roadbuilding. *See* Exs. 1336 (summarizing  
22   miles of road built at each site based on El Paso expense and production reports); 1389  
23   ¶ 17. A majority of the Cameron area waste-generating activity occurred between 1954  
24   and 1961. *See* Exs. 28 at 19; 1334.

25           El Paso disposed of hazardous substances at each of the Mine Sites. *See* Doc. 117  
26   ¶ 3. The United States did not direct waste handling or waste disposal. *See* Tr. at 907, 921,  
27   1204; Chenoweth Depo. Jan. 16, 2014, at 410. During mining, workers used a Geiger  
28   counter to asses wheelbarrow loads of ore and, if a load did not “measure so much on the



1 Geiger counter, they'd dump it over the hill [] someplace." Chenoweth Depo. Jan. 16,  
2 2014, at 410-11. Waste rock was dumped out of the way so it would not interfere with  
3 mining. Chenoweth Depo. Jan. 16, 2014, at 411; *see also* Ex. 69 at 10 (Arrowhead put  
4 waste wherever it was convenient).

5 The AEC bought uranium at the prices and bonuses set by the Circulars. Because  
6 miners could grade their uranium on an average monthly basis, they had an incentive to  
7 stockpile lower-grade ore and blend it with higher-grade ore to sell to the AEC. Chenoweth  
8 Depo. Apr. 24, 2014, at 36. This was a common practice. *See* Tr. at 1610; Ex. 15 at 3;  
9 Chenoweth Depo. Apr. 24, 2014, at 36-37.

10 When El Paso opened the Tuba City mill in 1956, it set an ore grade cut-off of .20%  
11 because that was more efficient for the mill's operation. Ex. 280; Chenoweth Depo.  
12 Apr. 24, 2014, at 163-64 (the ore grade cut-off was up to the mill, if the mill did not want  
13 to take the lower grade the AEC did not force them); *see also* Exs. 1231-32 (mining  
14 companies complaining that El Paso was not purchasing lower grade ore as permitted by  
15 the Circulars). Even before the mill changed the cut-off, miners were more focused on  
16 higher-grade uranium because it sold for a higher price. Chenoweth Depo. Apr. 24, 2014,  
17 at 37 (most miners could not make money at the .10% cut-off, so during the uranium boom  
18 the average grade was about .23%).

19 By late 1957, dramatic increases in reported uranium ore reserves and in milling  
20 capacity prompted the AEC to announce that "it no longer [was] in the interest of the  
21 Government to expand production of uranium concentrate." Ex. 25 at 12. The AEC  
22 announced that it would buy "only appropriate quantities of concentrate derived from ore  
23 reserves developed prior to November 24, 1958." *Id.* In 1958, the AEC announced that  
24 "domestic producers of uranium ores and concentrate" could start making private sales for  
25 the peaceful use of atomic energy, but no such sales were actually made until 1966. *Id.*

26 In 1962, the AEC implemented a "stretch-out" program which allowed mining  
27 companies to defer delivery of a portion of their contract commitments until 1967 and  
28 1968, in return for an AEC commitment to purchase the ore in 1969 and 1970. *Id.*

1 Operations at the Mine Sites phased down as incentives decreased, but there is also  
 2 evidence that ore reserves at the Mine Sites were exhausted by this time and no longer held  
 3 enough economically viable uranium. Chenoweth Depo. Jan. 16, 2014, at 410-14  
 4 (describing the process of using the Geiger counter to measure uranium from a mine; once  
 5 it was very low, mining would stop); *see also* Ex. 31 at 7 (“[A]s the known orebodies were  
 6 depleted, ore production declined sharply after 1958.”).

7 At the end of a mining lease, there was an inspection to ensure that sites were free  
 8 from physical hazards. *See* Tr. at 154; Ex. 1214; *see also* Chenoweth Depo. Apr. 24, 2014,  
 9 at 182. Open pits were left unfilled. *See* Prince Depo. Oct. 9, 1996, at 131. Language in  
 10 the leases and the customs of the day were to leave mines “timbered,” which meant leaving  
 11 the ore body accessible and, in the case of open pit mines, leaving the pit open. *See*  
 12 Tr. at 154, 1613 (timbered means the structural integrity of the pit walls).<sup>13</sup>

13 Language in the mine leases also stated that mines were to be surrendered and  
 14 returned in good condition except for ordinary wear and tear. *See* Tr. at 1576. El Paso’s  
 15 expert, Mr. Dempsey, testified that this provision did not affect the expectation that mine  
 16 pits would be left open. *See* Tr. at 1577; *see also* Prince Depo. Oct. 9, 1996, at 114. By  
 17 1962, El Paso and its subcontractors stopped all mining at the 19 Mine Sites. Prince Depo.  
 18 Oct. 9, 1996, at 68-69.

### 19 **3. Reclamation.**

20 For almost three decades, the Mine Sites remained largely in the same condition as  
 21 when mining ceased, with open pits and waste piles on the properties. In the 1980s, the  
 22 Navajo Nation became concerned about possible health impacts of abandoned uranium  
 23 mines on the Reservation. Ex. 1275; Prince Depo. Oct. 30, 1996, at 220-21. People were  
 24 frequenting the pits for recreational purposes, and livestock was watering at the pits. Prince  
 25 Depo. Oct. 30, 1996, at 221-22. As a result, in the early 1990s the Navajo Nation undertook  
 26

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27  
 28 <sup>13</sup> There is evidence that the Navajo Nation wanted mines closed after 1959  
 (Ex. 1274), but also some suggestion that this applied only to underground mines (Tr. 156).



1 reclamation of 17 of the 19 Mine Sites. Reclamation was not deemed necessary at  
2 Huskon 5 and 14. Doc. 159 at 9.

3 Funding for the reclamation was provided through grants from the federal  
4 government's Office of Surface Mining ("OSM") under the Surface Mining Control and  
5 Reclamation Act ("SMCRA"). Doc. 159 at 9. The Nation's office of Navajo Abandoned  
6 Mine Lands ("NAML") developed the plans for reclaiming the mines and submitted grant  
7 applications to the OSM. Martinez Depo. at 20-21. The OSM reviewed the applications  
8 prior to approving funding. *See id.* The OSM was deferential to the Nation in its review  
9 and oversight of the reclamation because of the Nation's status as a sovereign nation.  
10 Sassaman Depo. at 126-31. The OSM's role was to oversee the sites for compliance with  
11 the NAML plans and to offer advice when necessary. Martinez Depo. 34-36, 40-43;  
12 Sassaman Depo. 33-35, 106. All reclamation standards were established by the NAML.  
13 Martinez Depo. at 34-35; Sassaman Depo. at 29-30, 35, 56, 74-76.

14 Through five reclamation projects, the NAML (1) restored hundreds of acres of  
15 land, (2) backfilled and graded seventeen uranium mine pits formerly operated by El Paso,  
16 (3) removed or reduced the slopes of thousands of feet of dangerous highwalls and  
17 embankments, (4) contained mining waste underground to prevent erosion and reduce  
18 surface exposure, (5) built drainages structures to divert runoff from the pits and waste  
19 piles, (6) removed ponds of polluted water that were sometimes used for recreational and  
20 agricultural purposes, and (7) provided replacement ponds for livestock and wildlife. *See*  
21 Exs. 1279-85 (NAML technical specifications); 1310 (Project three update report); Prince  
22 Depo. Oct. 30, 1996, at 261-62. The United States provided the Nation with \$2.4 million  
23 in funding for this work. *See* Exs. 1294-1308 (total costs by each site).

24 **F. The Tuba City Mill.**

25 The Tuba City uranium mill was built and operated by El Paso, and purchased ore  
26 from Cameron-area mines, including the Mine Sites. The mill is not part of the EPA's  
27 current CERCLA directive to El Paso, and the parties disagree on whether its remediation  
28 is relevant to the Court's equitable allocation for the 19 Mine Sites at issue in this case.

1 Originally, Arrowhead and Rare Metals shipped ore to the AEC's Bluewater mill in  
2 New Mexico. Exs. 1222; 1162; 1163; 1243. In 1954, Rare Metals contacted the AEC  
3 about establishing a mill in the vicinity of the Mine Sites, which would significantly reduce  
4 haulage costs. Tr. at 1008; Ex. 107. Rare Metals and the AEC agreed that the AEC would  
5 operate an ore-buying station in Tuba City until Rare Metals could finish building the mill,  
6 and Rare Metals would then take over the ore-buying function. Exs. 1030 at 5; 1222; 1224.  
7 In July 1956, Rare Metals completed construction of the mill and began purchasing ore  
8 from mines in the area. Exs. 1241; 1235. The mill operated from 1956 to 1966 and  
9 produced 80,000 tons of yellow cake uranium for the United States. Ex. 1072 at 25.

10 In the Circulars, the AEC offered to purchase uranium ore above a .10% grade. The  
11 Tuba City mill adopted a stricter standard, requiring a grade of .20% on a monthly average  
12 basis. Exs. 131; 280; 1040; 1226 at 2.

13 The Tuba City mill generated its own waste pile in the form of "tailings," which  
14 consisted of low-level radioactive sand generated from processing uranium ore. Ex. 1317  
15 at 8; Prince Depo. Dec. 1, 2016, at 43-44. El Paso also disposed of liquid wastes from ore  
16 processing in an impoundment pond constructed near the mill. Exs. 1317 at 101; 1319 at 5.  
17 These operations contaminated groundwater at the site. Tr. at 1262.

18 El Paso stopped operation of the Tuba City mill in 1966 because uranium sources  
19 in the area were exhausted. *See* Ex. 1240 at 2. The Arizona Atomic Energy Commission  
20 ("Arizona AEC") oversaw the termination of El Paso's mill license. El Paso was required  
21 to stabilize the tailings pile (Ex. 1242), and consulted with the federal BOM to develop a  
22 stabilization plan (Ex. 176; Caulkins Depo. at 20-22).<sup>14</sup> El Paso's plan was submitted to  
23 and approved by the Arizona AEC, the United States Public Health Service, and the Navajo  
24 Minerals Resource Office. *See* Ex. 173. El Paso implemented the plan, and the Arizona  
25 AEC terminated El Paso's license, acknowledging that El Paso "effectively  
26 decontaminated the mill building," "stabilized the tailings pile against wind erosion," and  
27 "fenced and posted the tailings pile." Ex. 177; *see also* Tr. at 1252; Ex. 176.

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28 <sup>14</sup> The Rule 401 and 403 objections to this testimony are overruled.

1 Eventually, the United States remediated the mill site under the Uranium Mill  
 2 Tailings Radiation Control Act (“UMTRCA”). Ex. 1317 at 5, 18-20; 42 U.S.C. § 7901(a).  
 3 In UMTRCA, Congress acknowledged that uranium tailings at active and inactive mill  
 4 sites may pose a significant radiation health hazard to the public. *See* § 7901(a). UMTRCA  
 5 was designed to “stabilize and control [mill] tailings in a safe and environmentally sound  
 6 manner and to minimize or eliminate radiation hazards to the public.” § 7901(b). In effect,  
 7 the federal government assumed responsibility for the clean-up of uranium-producing mills  
 8 for the good of the country. Tr. at 1243. Where clean-up occurs on Indian lands, as at the  
 9 Tuba City mill, the government pays all costs. Ex. 1317 at 9.

10 The Tuba City mill remediation occurred in two phases from January 1985 to Apr.  
 11 1990. Ex. 1317 at 19. Through the end of 2018, the United States has spent \$34,143,000  
 12 in surface remedial action costs and \$59,426, 656 in groundwater remedial action costs, for  
 13 a total of more than \$93,500,000. *See* Ex. 1321. The monitoring process will continue  
 14 into perpetuity (Ex. 1320 at 7), with the United States’ future response costs projected to  
 15 reach \$37,288,757 (Ex. 1321).

#### 16 **G. The EPA and Remediation of the 19 Mine Sites.**

17 When the EPA identifies an abandoned uranium mine that contains a hazardous  
 18 substance, it requests that a potentially responsible party (“PRP”) conduct a Remedial Site  
 19 Evaluation (“RSE”). *See* 42 U.S.C. §§ 9606, 9607; 40 C.F.R. § 400.15. The RSE  
 20 investigates the nature and extent of contamination and associated risks. *See* 40 C.F.R.  
 21 § 400.20. It includes determining the background levels of radiation due to naturally  
 22 occurring uranium. Stavinoha Depo. at 64-65. In Cameron, background levels vary  
 23 dramatically from place to place and even within a particular site. *Id.* at 97. After an RSE,  
 24 the PRP prepares an Engineering Evaluation/Cost Analysis (“EE/CA”), which evaluates  
 25 potential response actions. Doc. 159 at 10; Tr. at 641.

26 In May 2012, the EPA sent El Paso a “general notice” letter identifying El Paso as  
 27 a PRP for the Mine Sites. Doc. 159 at 8; Stavinoha Depo. at 29. In 2013, El Paso signed  
 28 an administrative order of consent (“AOC”) to perform a “limited” investigation. Ex. 263;

1 Stavinoha Depo. at 53-54. El Paso agreed to conduct gamma screening to determine the  
2 lateral extent of disturbed areas within a portion of the 19 Mine Sites. *See* Ex. 263 at 33-34.  
3 El Paso submitted a number of work plans related to background levels and gamma  
4 scanning (Tr. at 610), and has not missed a deadline with the EPA (Tr. at 610-11).

5 In 2017, El Paso agreed to conduct RSEs at Huskon 12 and 14, modifying the  
6 original AOC. *See* Tr. at 613. In 2018, El Paso entered a second AOC amendment to  
7 perform EE/CAs at Huskon 12 and 14. *See* Tr. at 613-14. El Paso also submitted a draft  
8 for a third modification to perform RSEs for the remaining 17 Mine Sites. Tr. at 614. To  
9 date, El Paso has performed draft RSEs for Huskon 12 and 14. *See* Ex. 1325. El Paso has  
10 also prepared a draft EE/CA for both sites. *See* Ex. 285. The EPA has not yet provided  
11 comments on these drafts. *See* Tr. at 630. The EPA has not selected a final remedy for  
12 Huskon 12 and 14, and El Paso has not agreed to perform a remedy. Tr. at 666.

13 **H. Costs at Issue in this Order.**

14 For purposes of the actual response costs to be allocated in this order, the parties  
15 have agreed to a cut-off date of August 1, 2016. El Paso alleges that it has incurred  
16 recoverable response costs at the Mine Sites totaling \$1,393,448 through August 2016, and  
17 has paid another \$502,500 to the United States to reimburse certain EPA response costs.  
18 *See* Doc. 159 at 13. The United States does not dispute these amounts and stipulates that  
19 they are necessary, recoverable, and consistent with the National Contingency Plan. *Id.*  
20 12-13.<sup>15</sup>

21 The parties made clear at the final pretrial conference on February 13, 2019, that  
22 they are asking the Court not only to allocate these existing response costs, but also to enter  
23 a declaratory judgment establishing the allocation between them for purposes of all  
24 response costs related to the Mine Sites, including amounts to be incurred in the future.  
25 The parties agree that the Court need not address interest amounts due under CERCLA,

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26  
27 <sup>15</sup> The United States originally sought to recover response costs under § 107 in its  
28 counterclaim, but this claim was resolved in a consent decree between the parties. *See*  
Doc. 66. The consent decree did not resolve the United States' contribution claim under  
§ 113. *Id.*

1 stating that they can agree on such amounts once the Court sets its allocation. The parties  
 2 further stipulate that the Court should declare their allocated shares of liability as if all  
 3 response costs incurred by each party were allocated under § 113(f). Doc. 159 at 13.

## 4 **II. Liability.**

5 A contribution claim under § 113(f) includes four elements: (1) a release or  
 6 threatened release of hazardous substances; (2) from a facility as defined by CERCLA  
 7 § 9601(9); (3) which has caused the plaintiff to incur response costs that are necessary and  
 8 consistent with the National Contingency Plan; and (4) that the defendant is a PRP under  
 9 CERCLA § 107(a). 42 U.S.C. § 9607(a); *see also* Doc. 159 at 10-11; *City of Colton v. Am.*  
 10 *Promotional Events, Inc.*, 614 F.3d 998, 1002-03 (9th Cir. 2010); *Carson Harbor Village,*  
 11 *Ltd. v. Unocal Corp.*, 270 F.3d 863, 870-71 (9th Cir. 2001). The parties do not dispute that  
 12 the first three elements of § 113(f) liability are satisfied in this case, so the liability question  
 13 focuses on PRP status. Doc. 159 at 10-13.

14 There are four types of PRP liability: owners, operators, arrangers, and transporters.  
 15 42 U.S.C. § 9607(a). As noted above, El Paso stipulates that it was an operator of the Mine  
 16 Sites and the Court previously held that the United States is liable as an owner. Docs. 108,  
 17 135. El Paso argues that the United States is liable as an operator and arranger during all  
 18 of the mining phases (Doc. 187 at 1-13), and the United States asserts that El Paso is liable  
 19 as an arranger (Doc. 186 at 2-6).<sup>16</sup>

### 20 **A. United States' Operator Liability.**

21 CERCLA imposes liability on “any person who at the time of disposal of any  
 22 hazardous substance . . . operated any facility at which such hazardous substances were  
 23 disposed of.” 42 U.S.C. § 9607(a)(2). The word “operated” suggests that the liable party  
 24

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25 <sup>16</sup> The United States further argues that El Paso is liable as an owner because it  
 26 owned equipment at the Mines Sites and disposed of mining waste with that equipment.  
 27 *See* Doc. 157 ¶ 71. CERCLA broadly defines “owner” to include an owner of a “facility,”  
 28 and defines “facility” to include “equipment.” 42 U.S.C. §§ 9601(9), 9601(20)(A)(ii). But  
 case law is sparse on whether CERCLA liability can be premised on ownership of  
 equipment at a superfund site. The Court need not wrestle with this question, however,  
 because El Paso already is liable as an operator and, in the Court’s view of the equities,  
 adding equipment-owner liability would not change El Paso’s equitable allocation.

1 actually took some action with respect to the facility. The Supreme Court has agreed,  
 2 holding that “an operator must *manage, direct or conduct* operations specifically related to  
 3 pollution[.]” *United States v. Bestfoods*, 524 U.S. 51, 66-67 (1998) (emphasis added). The  
 4 Ninth Circuit similarly has held that an operator must play an “active role in running the  
 5 facility, typically involving hands-on, day to day participation in the facility’s  
 6 management.” *Long Beach Unified Sch. Dist. v. Dorothy B. Godwin Cal. Living Tr.*,  
 7 32 F.3d 1364, 1367 (9th Cir. 1994).

8 El Paso suggests that operator liability can be imposed on the basis of mere  
 9 “authority to control” operations at a site, even if that authority is not exercised. Doc. 187  
 10 at 2. The Ninth Circuit did state in *Kaiser Aluminum & Chemical Co. v. Catellus*  
 11 *Development Corp.*, 976 F.2d 1338 (9th Cir. 1992), that operator liability applies to a party  
 12 that “had the authority to control the cause of the contamination at the time the hazardous  
 13 substances were released into the environment.” *Id.* at 1341. But *Kaiser* did not hold that  
 14 unexercised authority is sufficient for operator liability. Rather, it imposed operator  
 15 liability on a party that actually excavated and graded the contaminated property, spreading  
 16 hazardous waste. *Id.* at 1339-40. *Kaiser*’s holding that such an actor is liable as an operator  
 17 comports with the Supreme Court’s instruction that operator liability “must be read to  
 18 contemplate ‘operation’ as including the *exercise* of direction over the facility’s activities.”  
 19 *Bestfoods*, 524 U.S. at 71 (emphasis added). It also squares with the Ninth Circuit’s  
 20 teaching that a party cannot be liable as an operator for merely “stand[ing] by and fail[ing]  
 21 to prevent the contamination.” *Long Beach*, 32 F.3d at 1367.<sup>17</sup>

### 22 **1. Exploration.**

23 El Paso asserts that the United States directed, managed, or conducted rim stripping  
 24 at several of the Huskon Mine Sites. *Id.* at 4. As explained above, the Court finds by a  
 25 preponderance of the evidence that the United States engaged in rim stripping at Huskon

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26  
 27 <sup>17</sup> Judge Winmill harmonized the Ninth Circuit’s language in *Kaiser* and *Long*  
 28 *Beach* with this definition: “CERCLA operator liability attaches if the defendant had  
 authority to control the cause of the contamination at the time the hazardous substances  
 were released into the environment and actually exercised such control.” *Nu-W. Min. Inc.*  
*v. United States*, 768 F. Supp. 2d 1082, 1089 (D. Idaho 2011) (citation omitted).



12, 14, and 17. These exploration activities released hazardous substances. *See* Tr. at 316-17, 372, 669, 1186-87. As a result, the United States controlled the “cause of the contamination at the time the hazardous wastes were released into the environment.” *Kaiser*, 976 F.3d at 1341. The United States is liable as a CERCLA operator for its role in rim stripping at these three Mine Sites.

## 2. Mining.

El Paso argues that the United States was an operator during the mining phase because it exercised control over mining operations through its authority over El Paso’s permits and leases. The evidence cited by El Paso in support of this proposed liability shows that the United States, through the BIA, approved mining permits and leases, possessed the authority to terminate permits and leases, rejected a lease at least once, retained authority to inspect the Mine Sites, required El Paso to comply with relevant regulations, and retained authority to hear disputes between El Paso and the Navajo Nation. *See* Doc. 187 at 5 (citing testimony and exhibits). But this evidence merely establishes that the United States had some “authority to control” what happened at the Mine Sites, not that the United States actually exercised that authority as required for operator liability, as explained above.

Several historical witnesses who worked at the Mine Sites testified that the United States did not have direct involvement in the mining operations. James Maloney testified that he never saw anyone from the federal government at the Mine Sites. Maloney Depo. at 28. George Morehouse reported that there was no federal oversight of the mining operations. Ex. 69 at 4-5. William Chenoweth testified that the AEC did not review or approve mining plans or supervise mining operations. Chenoweth Depo. Jan. 16, 2014, at 409; Chenoweth Depo. Apr. 24, 2014, at 23, 57.

The Court finds that the United States did not “manage, direct, or conduct operations specifically related to pollution,” *Bestfoods*, 524 U.S. at 66-67, and that mere possession of such authority is not enough for operator liability, *Long Beach*, 32 F.3d at 1367. Other cases have reached comparable conclusions. *See Cour D’Alene Tribe v. Asarco Inc.*, 280

1 F. Supp. 2d 1094, 1128-30 (D. Idaho, 2003) (finding no United States operator liability  
2 even where compliance with the government's wartime directives was mandatory); *see*  
3 *also Miami-Dade County v. United States*, 345 F. Supp. 2d 1319, 1344-46 (S.D. Fla. 2004)  
4 (holding that the manual detailing contractors' inspection and quality control  
5 responsibilities did not amount to direction of waste disposal practices).

6 El Paso argues that the United States exercised control of the Mine Sites through  
7 the AEC and the DUPP by (1) creating the domestic market for uranium ore; (2) exercising  
8 authority over the possession, transport, and delivery of the ore; (3) acting as the sole  
9 purchaser of the ore; (4) controlling El Paso's profits by controlling ore prices, bonuses,  
10 and allowances; and (5) setting the ore-grade cut-off, which determined what level of  
11 uranium-bearing materials necessarily would be left at the Mine Sites. Doc. 187 at 6. The  
12 Court agrees that the United States influenced the operations of El Paso and other uranium  
13 mining companies in the 1950s and 1960s. The DUPP was created to foster development  
14 of domestic uranium mines, the AEC actively promoted mining on the Colorado Plateau  
15 and in the Cameron area, the government regulated the acquisition and handling of uranium  
16 ore and was the sole purchaser of the ore for many years, and the AEC exercised some  
17 financial control over the uranium market through the Circulars. But El Paso was not  
18 conscripted into the uranium business, and the government did not tell it how to operate its  
19 mines or dispose of its waste. El Paso stayed in the business and expanded its operations  
20 as long as they were profitable and left the business when they were not. El Paso decided  
21 who to hire, how much to pay them, what equipment to use, how much money to invest,  
22 where to mine, how to mine, how to dispose of waste, and how long to operate. El Paso  
23 excavated the ore, created waste piles, and built the mill that had the effects of increasing  
24 the profitability of mining in the Cameron area and promoting the development and  
25 expansion of the Mine Sites and other mines. El Paso continued to mine and process  
26 uranium at the mill after the United States allowed private party purchases of uranium and  
27 announced its stretch-out program, and continued to process ore until the supply was  
28 exhausted. *See* Ex. 1240 at 2. Given these facts, the Court cannot conclude that the



1 influence exercised by the United States over uranium mining and markets rose to the level  
2 of “manag[ing], direct[ing], or conduct[ing] operations specifically related to pollution,”  
3 as required for CERCLA operator liability. *Bestfoods*, 524 U.S. at 66-67.

4 This is true even when the Court considers the most direct influence the government  
5 exerted on contamination-creating activities – the Circular’s establishment of a .10% grade  
6 cut-off. While it is true that this cut-off resulted in less concentrated uranium-bearing  
7 materials being left as waste at the sites, some cut-off level was required. El Paso cannot  
8 plausibly argue that no cut-off level should have been established – that even the most  
9 minute concentrations of uranium in soil or rock should have been purchased and milled  
10 on behalf of the government. This fact is best demonstrated by El Paso’s own .20% cut-  
11 off at the Tuba City mill. This level resulted not only in ore below .10% being left at the  
12 Mine Sites, but also in ore below .20% being left there. El Paso’s cut-off produced the  
13 same on-site contamination as the Circular, and more. The Court cannot conclude that the  
14 Circular’s cut-off level constituted sufficient managing, directing, or conducting of  
15 pollution-creating operations to give rise to operator liability.

16 Other cases which have considered comparable levels of government influence have  
17 reached the same conclusion. *See United States v. Iron Mountain Mines*, 987 F. Supp.  
18 1277, 1285 (E.D. Cal. 1997) (“Despite its creation of various incentives and programs to  
19 assist mining companies, the government did not compel Mountain Copper to do any  
20 mining at Iron Mountain; it did not require Mountain Copper to extract a certain amount  
21 of any substance from Iron Mountain; and it did not issue commands to Mountain Copper  
22 as to how, where, or when to mine.”); *see also Cour D’Alene Tribe*, 280 F. Supp. 2d at 1129  
23 (finding no operator status where the government lacked managerial control over the  
24 mines, the mines and mills were not forced to produce but elected to aid the war effort and  
25 participate in the government’s premium price plan, the mining companies owned the  
26 equipment used in the mines and mills, the government set the price for the metals but did  
27 not control who could purchase them, and the mining companies controlled the  
28 mechanisms creating the tailings and disposal of the tailings).

1           The facts of this case are also distinguishable from cases where the United States  
2 has been held liable as an operator. For example, in *FMC Corp. v United States*  
3 *Department of Commerce*, 29 F. 3d 833 (3d Cir. 1994), the Third Circuit found the  
4 government liable as an operator because it (1) required the facility to manufacture a certain  
5 product, (2) controlled the supply and price of the raw materials, (3) supplied equipment  
6 for use in the manufacturing process, (4) acted to ensure the facility retained an adequate  
7 labor force, (5) participated in the management and supervision of the labor force, (6) had  
8 authority to remove workers, and (7) controlled the price of the product and who could  
9 purchase the product. *Id.* at 843. In this case, the United States had no oversight of mining  
10 or labor activities at the Mine Sites, other than generic safety responsibilities, and did not  
11 compel El Paso to mine for uranium. *See* Tr. at 1580; *Coeur D’Alene Tribe*, 280 F. Supp.  
12 2d at 1130 (distinguishing *FMC* where the mining companies maintained actual control  
13 over the mines and mills, hired and fired its owner employees, and voluntarily decided to  
14 mine for metals and participate in the government’s premium plan).

15           In *Cadillac Fairview/California, Inc. v. Dow Chemical Co.*, 299 F. 3d 1019 (9th  
16 Cir. 2002), the government owned the site, the pits, the plant, and all materials, including  
17 the wastes, had unfettered control over Dow Chemical’s waste producing actions, and  
18 made an express agreement to indemnify Dow Chemical. The United States in this case  
19 did not exercise similar control and did not indemnify El Paso.

20           El Paso cites *MRP Properties, LLC v. United States*, 308 F. Supp. 3d 916 (E.D.  
21 Mich. 2018), to argue that even the government’s passive or unintentional control of the  
22 Mine Sites’ operations gives rise to operator liability. But *MRP Properties* involved a  
23 motion to dismiss for failure to state a claim. The trial court assumed all facts alleged in  
24 the complaint to be true and construed them in the plaintiff’s favor. *Id.* at 928. Those  
25 allegations included an assertion that the United States “controlled day-to-day operations  
26 at each refinery.” *Id.* The complaint also alleged that the government “oversaw” or  
27 “dictated” the “amount and type of wastes generated and released at each refinery and  
28 tracked these production loss statistics.” *Id.* at 929. In denying the motion to dismiss, the

1 *MRP* court noted that further factual development might disprove these allegations, stating  
2 that “[a] key factual question in this case is whether and to what extent the Government’s  
3 alleged control of inputs, outputs, conversion of facility operations, and constructions  
4 projects, was specifically brought to bear on operations having to do with leakage or  
5 disposal of hazardous waste.” *Id.* at 934. This case is different. The Court is making  
6 factual findings on a full evidentiary record, not deciding a motion to dismiss. The Court  
7 finds that the government did not manage, direct, or conduct disposal of hazardous waste  
8 at the Mine Sites, and that El Paso freely chose to enter the uranium mining business and  
9 contract with the United States. To the extent language in *MRP* can be read to suggest that  
10 the passive possession of authority gives rise to operator liability, the Court finds it  
11 inconsistent with the Supreme Court’s instruction that such liability “must be read to  
12 contemplate ‘operation’ as including the *exercise* of direction over the facility’s activities.”  
13 *Bestfoods*, 524 U.S. at 71 (emphasis added).

### 14 **3. Reclamation.**

15 El Paso argues that the United States is liable as an operator during the reclamation  
16 phase at the Mine Sites. Doc. 187 at 11. El Paso asserts that federal agencies worked with  
17 the Nation to plan and determine a “joint strategy” for reclaiming the sites. *Id.* Further,  
18 the United States paid for the reclamation through funding under the SMCRA grant. Once  
19 the reclamation strategy was in place, the OSM reviewed and approved the Nation’s plans  
20 and oversaw the work. *Id.* Specifically, El Paso asserts that the United States approved  
21 and oversaw the importation of off-site uranium-bearing material as cover on the  
22 reclamation sites. *Id.* at 11-12.

23 The Court does not agree with El Paso’s factual assertions. As discussed above, a  
24 division of the Navajo Nation – the NAML – created the reclamation’s guiding  
25 specifications. *See* Ex. 198; Sassaman Depo. at 29-30, 35, 56, 74-76; Martinez Depo.  
26 at 34-35. Once the plans were submitted for the SMCRA grant, the OSM provided  
27 oversight to ensure that the plans were being performed pursuant to the grant. *See* Martinez  
28 Depo. at 20-21. But management of the day-to-day reclamation activities and handling of

1 all reclamation subcontracts was performed by the Nation. *See* Tr. at 517-18. The OSM  
2 employees responsible for overseeing the reclamation testified that their job was to make  
3 sure the site existed, ensure that the work followed the Nation's reclamations standards,  
4 and give suggestions where appropriate. *See* Martinez Depo. 34-36, 40, 41-43; Sassaman  
5 Depo. 33-35, 106. The OSM employees were conscious of the fact that the Navajo Nation  
6 was an independent sovereign that should be granted special deference. Sassaman Depo.  
7 at 126-31.

8 El Paso's own expert, Mr. Beahm, acknowledged that the Navajo Nation took the  
9 lead on reclamation. The Nation conducted an inventory of the Mine Sites in the 1980s  
10 and decided in the early 1990s to reclaim 17 of the 19 sites (Tr. at 511); performed the  
11 assessments for the reclamation projects (*id.* at 516); developed the technical specifications  
12 for the projects (*id.*); selected the contractors who would do the work (*id.*); and performed  
13 the day-to-day management of the projects (*id.* at 517-18).

14 El Paso argues that various federal government agencies participated in planning  
15 the reclamation project. *See* Tr. at 516-17. But this was due to the overlap between the  
16 EPA's authority to prioritize hazardous waste sites and the NAML's authority to reclaim  
17 sites that present public health hazards. El Paso points to a letter from the EPA to the DOI  
18 regarding a meeting among several federal agencies. *See* Ex. 198. But the letter indicates  
19 that the NAML should continue to reclaim sites under SMCRA and develop reclamation  
20 standards in conjunction with the Navajo Superfund Program ("NSP"). *Id.* Meanwhile,  
21 the NSP should continue working with the EPA to identify sites that are not eligible for  
22 SMCRA funding. *Id.*; *see also* Ex. 201 (letter stating that the NAML should continue  
23 reclamation and SMCRA clean-up will be the most appropriate funding source). Thus, the  
24 cooperation identified by El Paso resulted in substantial deference to tribal environmental  
25 agencies and does not indicate that the federal government exercised control over  
26 reclamation at the Mine Sites. The Court finds that the United States was not a CERCLA  
27 operator with respect to reclamation.<sup>18</sup>

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28 <sup>18</sup> El Paso's citation to *California Department of Toxic Substances Control v. Jim*

1           **B. Arranger Liability.**

2           El Paso argues that the United States was an arranger during all three phases of  
 3 mining. An arranger is “any person who by contract, agreement, or otherwise arranged for  
 4 disposal or treatment” of hazardous substances. 42 U.S.C. § 9607(a)(3). The Supreme  
 5 Court has held that, “[i]n common parlance, the word ‘arrange’ implies action directed to  
 6 a specific purpose.” *Burlington N. & Santa Fe Ry. Co. v. United States*, 556 U.S. 599, 611  
 7 (2009). “Consequently, under the plain language of the statute, an entity may qualify as  
 8 an arranger . . . when it takes intentional steps to dispose of a hazardous substance.” *Id.*  
 9 Mere knowledge of possible disposal is not enough: “knowledge alone is insufficient to  
 10 prove that an entity ‘planned for’ the disposal[.]” *Id.* at 612. A party must act “with the  
 11 intention” that hazardous waste be disposed in the transaction in which the party is  
 12 participating. *Id.*

13           El Paso’s argument regarding the government’s arranger liability largely overlaps  
 14 its argument on operator liability. Both are based on essentially the same government  
 15 activity. As a result, although the two forms of CERCLA liability differ, the Court’s ruling  
 16 on arranger liability largely tracks its ruling on operator liability.

17           **1. Exploration Phase.**

18           El Paso argues that the AEC arranged for its primary contractor to perform rim  
 19 stripping at the mine sites. Doc. 187 at 5. The Court has already held that the United States  
 20 is an operator for purposes of the exploration activities at Huskon 12, 14, and 17. The  
 21 Court concludes that government arranger liability has not been proved for the other Mine  
 22 Sites, for reasons explained above, and that imposing arranger liability for Huskon 12, 14,  
 23

24  
 25           \_\_\_\_\_  
 26 *Dobbas, Inc.*, No. 2:14-595 WBS EFB, 2014 WL 4627248 (E.D. Cal. Sept. 16, 2014), is  
 27 not helpful. That case recognized, as this Court does, that whether a government is liable  
 28 as a CERCLA operator of a facility “depends on whether it managed, directed, or  
 conducted operations there.” *Id.* at \*3. The district court addressed a motion to dismiss,  
 accepted all allegations as true, construed the allegations in the light most favorable to the  
 claiming party, and held only that a State’s issuance of several remedial action plans over  
 a period of years “could plausibly constitute management or direction of operations there.”  
*Id.* The case did not attempt to specify what level of involvement is necessary to trigger  
 CERCLA liability and provides no guidance in this case.

1 and 17 would not change the Court's equitable allocation in this case. As a result, the Court  
2 need not decide whether United States is an arranger for these three sites.

## 3 **2. Mining Phase.**

4 El Paso argues that the United States was an arranger during the mining phase  
5 because of the Circulars' ore grade cut-off level. Doc. 187 at 7. El Paso asserts that this  
6 level shows the United States intended mine operators to separate and leave behind low-  
7 grade uranium-bearing materials. *Id.* at 8.

8 The Court agrees that the United States knew low-grade uranium-bearing material  
9 would be left at the Mine Sites, although, as noted above, such a result was likely an  
10 inevitable result of any mining process. But as the Supreme Court has made clear,  
11 knowledge is not enough. The party must "take[] intentional steps to dispose of a  
12 hazardous substance." *Burlington*, 556 U.S. at 611.

13 The evidence does not show that the United States took intentional steps to dispose  
14 of waste at the Mine Sites during the mining phase. As already discussed, El Paso decided  
15 what equipment to use, where to mine, how to mine, how to dispose of waste, and how  
16 long to operate the mines. El Paso excavated the ore at the Mine Sites and created the  
17 waste piles. The government's cut-off levels may have influenced what waste was left  
18 behind, just as El Paso's higher mill cut-off level did, but such influence does not amount  
19 to intentional action to dispose of hazardous materials.

## 20 **3. Reclamation Phase.**

21 El Paso asserts that federal agencies took a leading role in establishing the  
22 reclamation strategy and approving grant applications, reclamation plans, and the  
23 comingling of waste from mines operated by third parties. Doc. 187 at 13. According to  
24 El Paso, these actions were intentional steps to arrange for the disposal of hazardous  
25 substances that resulted from dispersal of waste piles, disturbance of native uranium-  
26 bearing material, and the import of uranium-bearing material to the Mine Sites. *Id.*

27 As explained above, however, the Court does not find that the United States  
28 controlled the reclamation work or set the reclamation standards. Its role in reclamation

1 was primarily as the source of reclamation funds. The Court cannot conclude that the  
2 United States' general oversight and funding responsibilities amounted to "intentional  
3 steps to dispose of a hazardous substance." *Burlington*, 556 U.S. at 611.

#### 4 **4. Broader Arranger Liability.**

5 In *United States v. Shell Oil Co.*, 294 F.3d 1045 (9th Cir. 2002), which predated the  
6 Supreme Court's decision in *Burlington*, the Ninth Circuit discussed what it characterized  
7 as "broader arranger liability." *Id.* at 1055. The court addressed whether the United States  
8 was subject to arranger liability for its actions in the production of aviation gas ("avgas")  
9 during World War II.

10 "Because avgas was critical to the war effort, the United States government  
11 exercised significant control over the means of its production during World War II." *Id.*  
12 at 1049. The government established several agencies to oversee war-time production;  
13 established a nationwide priority ranking system to identify scarce goods, prioritize their  
14 use, and facilitate their production; made policy determinations regarding the construction  
15 of new facilities and allocation of raw materials; had authority to issue production orders  
16 to refineries; entered contracts to ensure avgas production; offered low-cost loans to  
17 refineries to help finance the construction of avgas-producing plants; assisted refineries in  
18 exchanging and blending various avgas components in order to maximize production;  
19 directed that specific component exchanges be made; provided detailed instructions for  
20 blending; directed refiners to blend avgas in a way that would allow increased overall  
21 production; but did not exercise direct actual control over the production of avgas  
22 components. *Id.* at 1049-50. The government knew avgas production generated acid  
23 wastes and that increased avgas production increased acid waste generation, but it never  
24 specifically ordered or approved the dumping of the spent acid that caused contamination.  
25 *Id.* at 1051. In addressing the United States' arranger liability in light of these facts, the  
26 Ninth Circuit considered four circuit court decisions.

27 One of the cases found arranger liability where the party owned hazardous  
28 chemicals, arranged for their blending by another company, and knew that the blending



1 process generated and disposed of hazardous waste. *See United States v. Aceto Agric.*  
2 *Chems. Corp.*, 872 F.2d 1373, 1381 (8th Cir.1989). The Ninth Circuit in *Shell Oil* found  
3 that *Aceto* was not persuasive because, in the avgas case before it, the United States was  
4 the end purchaser of avgas, never owned any of the raw materials or intervening products,  
5 and did not contract out a crucial and waste-producing intermediate step in a manufacturing  
6 process. 294 F.3d at 1056.

7 The second case imposed arranger liability on a company whose vice president  
8 agreed with a third party to bury drums of chemical waste on a farm several miles from the  
9 plant. *See United States v. Ne. Pharm. & Chem. Co.*, 810 F.2d 726 (8th Cir.1986). The  
10 Ninth Circuit found the case inapplicable because the United States in its avgas operations  
11 “did not exercise any actual control over the Oil Companies’ disposal of spent acid and  
12 acid sludge[.]” 294 F.3d at 1057.

13 In the third case, the en banc Eighth Circuit split evenly on the question of whether  
14 the United States was an arranger for its World War II involvement in rayon manufacturing.  
15 The government vigorously sought to increase production of rayon during the war, installed  
16 government-owned rayon-manufacturing equipment at a plant, ensured an adequate supply  
17 of sulfuric acid for the plant, built and retained ownership of a new acid plant next door,  
18 obtained draft deferments for workers at the plant, directly controlled the process by which  
19 the rayon was manufactured, directly controlled the supply of the raw materials, and  
20 directly controlled the price of the rayon produced. *See FMC Corp.*, 29 F.3d at 833. The  
21 Ninth Circuit observed that “[i]f it was a close question on the facts of *FMC* whether the  
22 United States was an arranger, it cannot possibly be a close question on the facts in the case  
23 before us.” 294 F.3d at 1058.

24 Finally, *Shell Oil* considered another case where the Eighth Circuit held that the  
25 United States was not an arranger in connection with the production of Agent Orange  
26 during the Vietnam War. *See United States v. Vertac Chem. Corp.*, 46 F.3d 803 (8th Cir.  
27 1995). The Ninth Circuit found the facts in *Vertac* comparable to the avgas facts before it  
28



1 and concluded that the United States was not an arranger. The court provided this  
2 comparison between the avgas and Agent Orange facts:

3 In both cases, products were manufactured for purchase by the United States  
4 in war-time; in both cases, the manufacturing was carried out under  
5 government contracts and pursuant to government programs that gave it  
6 priority over other manufacturing; in both cases, the companies voluntarily  
7 entered into the contracts and profited from the sale; and in both cases, the  
8 United States was aware that waste was being produced, but did not direct  
9 the manner in which the companies disposed of it.

10 294 F.3d at 1059.

11 These facts – recited from *Shell Oil* and *Vertac* – closely parallel the facts in this  
12 case. Uranium ore was mined for purchase by the United States in war-time; the mining  
13 was carried out under government-approved permits and leases and pursuant to a  
14 government program that sought to encourage domestic uranium production; El Paso  
15 voluntarily entered into the mining and profited from both mining and milling; and “the  
16 United States was aware that waste was being produced, but did not direct the manner in  
17 which the [El Paso] disposed of it.” *Id.* The Ninth Circuit held in *Shell Oil* that the United  
18 States was not an arranger, a holding which makes clear that the government is not an  
19 arranger in this case, even under the “broader arranger theory.” *See Coeur D’Alene Tribe*,  
20 280 F. Supp. 2d at 1132 (“The *Shell [Oil]* court determined that mere ‘authority to control’  
21 was insufficient without some actual exercise of control.”).<sup>19</sup>

## 22 **5. El Paso Arranger Liability.**

23 The United States argues that El Paso should be liable as an arranger because it  
24 exercised actual control over all aspects of the mining operations, including disposal of  
25

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26 <sup>19</sup> As part of its argument for arranger liability of the United States, El Paso cites an  
27 Arizona case from 1914 and a Ninth Circuit case from 1908 for the proposition that waste  
28 rock at the Mine Sites always belonged to the United States because, although it was  
moved, there was never an intent to sever it from the realty. Doc. 187 at 10. But El Paso  
does not explain why these cases apply to land on the Navajo Nation Reservation, and the  
Court notes that at least one more recent case has rejected this legal principle for federal  
lands. *See Chevron Mining Inc. v. United States*, 863 F.3d 1261, 1283 (10th Cir. 2017)  
 (“The United States neither owned nor possessed the waste rock and tailings extracted from  
Chevron’s molybdenum mining activities.”). El Paso’s argument does not alter the Court’s  
conclusion that the United States was not a CERCLA arranger during the mining phase.

1 mining waste at the Mine Sites. *See* Docs. 186 at 3; 157 at 80-82 ¶¶ 62. El Paso has already  
2 conceded its operator liability, which encompasses control over waste-generating  
3 activities. The Court concludes that imposing arranger liability for the same actions would  
4 not change the Court's equitable allocation in this case. As a result, the Court need not  
5 decide whether El Paso is an arranger

### 6 **III. Equitable Allocation.**

7 The Court may allocate response costs among liable parties using such equitable  
8 factors as the Court determines are appropriate. 42 U.S.C. § 9613(f)(1). The liability of a  
9 responsible person under § 113(f) corresponds to that party's equitable share of the total  
10 liability. *Fireman's Funds Ins. v. City of Lodi, Cal.*, 302 F.3d 928, 945 (9th Cir. 2002).

#### 11 **A. El Paso's Proposed Allocation.**

12 El Paso suggests that the Court allocate responsibility for all past and future  
13 response costs by (1) creating three categories or buckets, one for exploration, one for  
14 mining, and one for reclamation; (2) assigning a percentage of overall site responsibility to  
15 each of these three buckets based on the volume of soil moved during each phase;  
16 (3) allocating the portion within each bucket between El Paso and the United States; and  
17 (4) adding the percentage allocated to each party in each of the three buckets to arrive at  
18 the overall allocation. Using this model, El Paso's proposed allocation assigns 86.77% of  
19 the liability for the Mine Sites to the United States, and 13.23% to El Paso. The Court  
20 disagrees both with the percentage of site responsibility El Paso assigns to each of its  
21 proposed buckets and with its suggested allocation within each bucket.

#### 22 **1. El Paso's Percentage Division Among Buckets.**

23 El Paso's three-bucket approach was developed by its allocation expert, David  
24 Batson. He allocated a percentage of overall site responsibility to each bucket by adopting  
25 Mr. Beahm's estimates of the amount of soil moved during each of the three phases of  
26 mining. Tr. at 735-36. The Court finds this approach seriously flawed.

27 During the exploration phase, Mr. Beahm estimated that 132,000 cubic yards of soil  
28 was moved, amounting to about 7% of all soil moved during the exploration, mining, and

1 reclamation phases. Mr. Batson therefore assigned 7% of the overall responsibility for  
2 response costs to the exploration bucket. Mr. Beahm reached this 7% calculation by  
3 relying on the 45,000 linear feet of trenching he attributes to the 45-day AEC exploration  
4 window. As explained above, however, the Court cannot accept Mr. Beahm's conclusion  
5 that 45,000 feet of trenching was done at the Mine Sites in late 1953 and early 1954 when  
6 it is not shown on the 1954 aerial photographs, nor that all of it was done by the AEC. The  
7 Court has little confidence in Mr. Beahm's conclusion about the amount of soil moved  
8 during the exploration phase, and therefore in Mr. Batson's assignment of 7% of the overall  
9 site responsibility to the first bucket.

10 The size of the second bucket – 59% of overall site responsibility – is based on Mr.  
11 Beahm's calculation of the amount of soil moved and left at the site during the mining  
12 phase. He calculated that amount by estimating the volume of the mine pit at each site,  
13 subtracting from that volume the amount of ore sold from the site, and increasing the result  
14 by 20% to reflect the fact that soil expands after it is removed from the ground. Tr.  
15 at 418-19. But this calculation assumes that the only soil El Paso moved at the Mine Sites  
16 was the soil that came from within the walls of the pits as they appeared when Mr. Beahm  
17 visited the site decades later or in aerial photographs taken before reclamation by the  
18 Navajo Nation. The calculation fails to account for soil moved by El Paso at the Mine  
19 Sites to excavate overburden down to where the pit mining actually started; to clear ground  
20 for mine structures, ore piles, ore blending, and waste piles; to build ramps into and out of  
21 mine pits; and to build roads around and into the Mine Sites. See Tr. at 1500-01.

22 The amount assigned by El Paso to the third bucket – 34% – is based on Mr.  
23 Beahm's estimate of the amount of new soil moved during reclamation. Mr. Beahm noted  
24 that the volume of soil moved during reclamation was higher than his calculated volume  
25 for mining. Tr. at 413-17. He subtracted his mining volume from the reclamation volume  
26 and arrived at 643,308 cubic yards of soil that he claims was moved for the first time during  
27 reclamation. Tr. at 1396. He explains this additional soil movement by assuming that the  
28 Nation's reclamation contractors moved more soil than necessary when reclaiming waste

1 piles. Tr. at 420. He asserts that they likely dug into the soft undisturbed dirt when moving  
 2 the waste piles. Tr. at 477-78. He also notes that soil was brought from off-site to complete  
 3 the reclamation. Tr. at 479-80. The Court views this reclamation calculation as unreliable  
 4 because it relies on Mr. Beahm's mining volume, which the Court finds unreliable for  
 5 reasons stated above. The Court also has difficulty with the implicit assumption that the  
 6 movement of additional soil in reclamation was unnecessary – that reclamation could have  
 7 been accomplished by moving no more soil than was originally disturbed during mining.  
 8 No evidence was presented to support this assumption, and yet it is the basis for the third  
 9 bucket, which is a percentage of site costs independent of mining and exploration activities  
 10 that El Paso claims should be assigned to somebody. If the movement of additional soil  
 11 was a necessary part of reclaiming the Mine Sites, then it could be considered a product of  
 12 mining and allocated in accordance with the mining allocation. The Court cannot agree  
 13 that it should be treated as a separate percentage of the overall site costs to be allocated  
 14 without regard to mining activities, as El Paso proposes.

## 15 **2. El Paso's Allocation Within Each Bucket.**

16 The Court also disagrees with how El Paso's allocates responsibility within each  
 17 bucket. The first bucket represents 7% of the overall response cost liability, and El Paso  
 18 allocates 70% of it to the United States and 30% to itself. This allocation assumes that the  
 19 AEC did all of the exploration at the 12 Huskon Mine Sites accounted for in this bucket  
 20 and during the 45-day window. Tr. at 735.<sup>20</sup> As noted above, the Court does not find this  
 21 position credible. The Court finds that the United States engaged in exploration activities  
 22 at Huskon 12, 14, and 17, considerably less than all of the exploration activities that  
 23 occurred at the 12 Huskon Mine Sites in El Paso's proposed first bucket.

24 For the second bucket – the mining phase – Mr. Batson starts with an allocation of  
 25 two-thirds liability to the United States as landlord, active owner of the land, and arranger  
 26 for the disposal of the hazardous substances, and one-third to El Paso as an operator that

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27  
 28 <sup>20</sup> Initially, Mr. Batson noted 15 Huskon sites, but he scaled this back to 12 sites,  
 omitting Huskon 5, 6 and 9, the three sites where El Paso decided not to seek contribution  
 for the exploration phase. *See* Tr. at 752.

1 conducted mining activities. Tr. at 738. From this largely unexplained baseline, Mr.  
2 Batson considers the impact of four equitable factors: (1) the benefits received by each  
3 party, (2) the degree of knowledge regarding the risks of the contamination, (3) the degree  
4 of cooperation by the parties, and (4) the degree of control and care exercised by each party  
5 in relation to knowledge. Tr. at 739. Based on these factors, Mr. Batson recommends  
6 increasing the United States' share by ten percent (Tr. at 741), although he does not explain  
7 how he arrived at this specific amount. He also assigns the United States the orphan shares  
8 for Huskon 4, 5, 8, and 9. Tr. at 745. When all of his second-bucket allocation is  
9 completed, Mr. Batson assigns 81% of the second bucket to the United States and 19% to  
10 El Paso. Tr. at 746.

11 The Court disagrees with Mr. Batson's baseline. The period represented by the  
12 second bucket was the primary waste-generating phase at the Mine Sites – years when the  
13 mines were in operation and creating waste piles. El Paso was the key actor in these  
14 operations. As will be clearer from the Court's allocation discussion below, the Court can  
15 see no justification for assigning the United States a supermajority of liability for mining  
16 operations El Paso performed.

17 In the third bucket, Mr. Batson assigns 100% of the liability to the United States as  
18 the only operator during the reclamation phase. Tr. at 746. His assessment is based on El  
19 Paso's view that the Nation's reclamation created additional waste by moving too much  
20 soil and by moving in radioactive material from off-site. *See* Tr. at 860-61.

21 The Court's first disagreement is that the United States is not an operator during this  
22 phase, as explained above. The Court also finds that the reclamation projects most likely  
23 will decrease, rather than increase, the ultimate clean-up costs at the Mine Sites. El Paso  
24 has evaluated possible remedies in draft RSEs and EE/CAs for Huskon 12 and 14. *See* Tr.  
25 at 677. These represent two of the most contaminated Mine Sites, and yet three of the four  
26 remedies proposed by El Paso involve no excavation of the mine pits where wastes were  
27 placed during reclamation. Nor does El Paso propose that entirely new caps be placed on  
28 the mounds now found where the mine pits once were located. Instead, El Paso proposes

1 that it enhance and maintain the reclamation work performed by the NAML. *See* Ex. 285  
2 at 11-13.

3 Although the EPA has not responded to El Paso's proposal, it appears likely that El  
4 Paso will not be required to excavate the mine pits and move contaminated soil off-site to  
5 other locations, particularly given the arid and still-remote positions of the Mine Sites.<sup>21</sup>  
6 The Court finds it more likely that El Paso will be required to upgrade caps on the waste  
7 piles and improve storm-water run-off and erosion protection systems. It may also be  
8 required to address contamination in drainages and other areas that were not addressed in  
9 the reclamation work. If this is true, the excavation of waste piles and filling of mine pits  
10 performed by the Navajo Nation during reclamation most likely will have reduced, not  
11 increased, the response costs at the Mine Sites.

12 Mr. Werth, El Paso's remediation project manager, testified that the reclamation  
13 work will increase remediation costs, but the Court did not find this testimony credible.  
14 He suggested that areas on the Mine Sites with the highest gamma readings were in  
15 locations that have not been reclaimed, suggesting that reclamation lowered radiation  
16 levels. Tr. at 624-25. He testified that erosion of the reclamation mounds will increase  
17 remediation costs (*see* Tr. at 621), but there is evidence that the mine sites were eroding  
18 prior to the reclamation work (Ex. 189). The Court cannot find that erosion of the capped  
19 waste mounds created during reclamation has caused more contamination than would have  
20 been caused by erosion of uncovered waste piles left at the sites by El Paso.

21 Nor did El Paso persuasively show that reclamation made the sites worse by  
22 bringing in radioactive fill material from other sites. Mr. Beahm did testify that soil was  
23 brought from other locations to provide cover at the Mine Sites, and that some of these  
24 locations were other uranium mines. Tr. at 460-63, 516-17. But he did not testify that the  
25 material brought to the Mine Sites was contaminated. He noted that the radiation level  
26 used by the Nation in reclamation was 25 picocuries per gram, implying that materials near  
27

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28 <sup>21</sup> El Paso itself asserts that excavation of the filled mine pits today would not allow  
it to segregate the mixed waste for separate remediation treatment. Tr. at 474.

1 this level could have been imported for cover, but he did not testify that this actually  
2 occurred. *Id.* El Paso provides a long string cite of various exhibits and deposition pages  
3 to support its position (Doc. 187 at 11-12), but none of the cited evidence shows that  
4 contaminated material was brought onto the Mine Sites during reclamation. To the  
5 contrary, at least one historical document states that the imported material was “clean.”  
6 Ex. 224. The Court accordingly does not find that reclamation made the sites more  
7 contaminated as El Paso asserts.

8 To summarize, the Court finds El Paso’s proposed allocation to be quite unreliable  
9 – contrived to assign maximum responsibility to the United States.

10 **B. The United States’ Proposed Allocation.**

11 The government’s allocation expert, Mr. Low, did not present a framework similar  
12 to Mr. Batson’s. He instead opined that the United States’ trust ownership of the land  
13 should reduce the costs allocated to it. Tr. at 1298. And he emphasized involvement of  
14 the parties, benefits to the parties, and cooperation as the three main factors for the Court  
15 to consider. Tr. at 1302-08. Mr. Low opined that the equitable share for the United States  
16 in this case should not exceed 25%, but he did not fully explain how he applied his equitable  
17 factors to reach this proposed limit. The Court does not find his allocation analysis helpful.

18 **C. The Court’s Allocation.**

19 In apportioning response costs among responsible parties, CERCLA requires only  
20 that the Court use “such equitable factors as the court determines are appropriate.”  
21 42 U.S.C. 9613(f)(1). Courts often start allocation analysis with the Gore factors originally  
22 contained in a bill proposed by then-Congressman Al Gore. *See Burlington*, 520 F.3d  
23 at 940 n.26. These include (1) the ability of the parties to demonstrate that their  
24 contribution to a discharge, release or disposal of a hazardous waste can be distinguished;  
25 (2) the amount of the hazardous waste involved; (3) the degree of toxicity of the hazardous  
26 waste; (4) the degree of involvement by the parties in the generation, transportation,  
27 treatment, storage, or disposal of the hazardous waste; (5) the degree of care exercised by  
28 the parties with respect to the hazardous waste, taking into account the characteristics of



1 such hazardous waste; and (6) the degree of cooperation by the parties with federal, state,  
2 or local officials to prevent any harm to the public health or the environment. *See TDY*  
3 *Holdings, LLC v. United States*, 885 F.3d 1142, 1146 (9th Cir. 2018). Courts also consider  
4 (1) the extent to which the clean-up costs are attributable to wastes for which a party is  
5 responsible; (2) the party's level of culpability; (3) the degree to which the party benefitted  
6 from disposal of the waste; and (4) the party's ability to pay its share of the costs. *United*  
7 *States v. Davis*, 31 F. Supp. 2d 45, 63 (D.R.I 1998). The Court will consider all of these  
8 factors.

9 **1. Gore Factors.**

10 **a. Distinguishability of Each Party's Waste.**

11 There is only one type of waste at issue in this case – radioactive remnants of  
12 uranium mining. Both parties claim the other is partially responsible for this single form  
13 of waste. The Court cannot accept El Paso's three-bucket approach for reasons explained  
14 above, and finds no other reasonable basis for distinguishing one party's waste from the  
15 other's.

16 **b. Amount of Hazardous Waste.**

17 The Court cannot identify a volume of hazardous waste that can be neatly attributed  
18 to one party and not the other. The fight is over waste that has not been quantified. As  
19 noted, the Court does not agree with El Paso's attempt to estimate a soil volume attributable  
20 to each of the parties.

21 **c. Degree of Toxicity.**

22 With only one type of contaminant blended in the soil throughout the Mine Sites,  
23 this factor is not relevant. *See Gavora, Inc. v. City of Fairbanks*, No. 4:15-cv-00015-SLG,  
24 2017 WL 3161626, at \*8 (D. Alaska July 25, 2017) (noting that this factor is most relevant  
25 when there are two types of discharges by two distinct actors, and one is more toxic).

26 **d. The Degree of Involvement.**

27 This is the most important factor in this case. El Paso, as the Mine Sites' operator,  
28 was the primary party responsible for the generation and disposal of waste at the sites. El



1 Paso excavated uranium ore in open pit mines, stockpiled ore on the property, and  
2 stockpiled waste on the property. El Paso also built and operated the Tuba City mill, which  
3 purchased uranium from its own mines and others in the area.

4 The United States did not directly oversee El Paso's mining operations or instruct it  
5 on where or how to dispose of waste. But the United States did own the land in trust for  
6 the Navajo Nation and was obligated to hold it for the best interests of the Nation. In this  
7 capacity, the United States reviewed and approved permits and leases, included various  
8 oversight powers in the permits and leases, advised the Nation on its uranium regulation  
9 activities, and collected rents and royalties for the Nation's benefit. The Court concludes  
10 that the United States should be assessed a 5% share for these ownership activities.

11 But this assessment does not fully account for the government's substantial  
12 involvement in this case. The United States did much more than simply act in its trust  
13 capacity for the Nation's benefit. It created the DUPP to obtain uranium and further the  
14 national defense. It created the market for uranium by publishing the Circulars and  
15 establishing buying stations. It encouraged uranium mining throughout the United States  
16 and in the Cameron area by researching best exploration and mining practices and engaging  
17 in exploration and road-building. It was the only purchaser of uranium ore, and it reviewed  
18 and approved El Paso's construction and operation of the Tuba City mill. Charlie's Steen's  
19 million-dollar discovery may have sparked the uranium "gold rush" in the minds of the  
20 public (Tr. at 1600), but the United States played a primary role in the creation and growth  
21 of uranium mining in the 1950s, including at the Mine Sites.

22 How, then, does the Court balance the parties' respective roles – El Paso's for-profit,  
23 on-the-ground, excavation and disposal of the uranium waste that must now be remediated,  
24 together with its operation of the mill that created a local uranium purchaser for its mines  
25 and others, versus the government's role in promoting, facilitating, and assisting in uranium  
26 mine development generally and its exploration of some of the Mine Sites?

27 The Court begins by noting that El Paso was directly involved in every step of waste  
28 generation. With the exception of the relatively small orphan shares that will be assigned

1 below, El Paso moved every cubic foot of radioactive soil that has created an environmental  
2 hazard at the sites. It opened the mines, hired the workers, acquired the machinery,  
3 excavated the soil, created the waste and ore piles, loaded the trucks, and blended the ore.  
4 It decided how long to operate each mine, how much soil to disturb, and, within the limits  
5 of the mines' capacities, how much ore to produce. It built and operated the mill that made  
6 the Cameron area mines, including its own mines, more profitable. It set the ore grade cut-  
7 off at the mill that determined what levels of waste would be left at mines. In short, El  
8 Paso was the principal actor, the primarily responsible party for generating the waste at  
9 issue in this case. El Paso was not dragooned by the United States into this activity. Like  
10 many others drawn to uranium mining in the 1950s and 1960s, it sought to make a profit  
11 and dutifully reported its mining profits to management and shareholders each year.

12 The United States, by contrast, was not an on-site actor in the waste generating or  
13 disposal activities. With the exception of some exploration work at Huskon 12, 14, and 17  
14 in the early years, it had no direct involvement in the mining or waste generation. It did,  
15 to be sure, exert influence over those operations. It created financial incentives, promoted  
16 uranium mining on the Colorado Plateau, approved construction of the mill, and purchased  
17 uranium ore and concentrate.

18 Comparing these two parties, the Court concludes that El Paso was the primary actor  
19 but that the United States should bear some meaningful share of the responsibility.  
20 Therefore, in addition to the 5% that the Court has assigned the United States for its trust  
21 ownership of the land and the actions it took to oversee and approve permits and leases,  
22 the Court assigns 25% to the United States for creating the conditions and market that led  
23 to mining at the Mine Sites, and for its limited exploration at three sites. The Court assigns  
24 70% to El Paso for its role as the primary generator of the contamination – an amount that  
25 will be adjusted slightly when the Court considers the relative benefits to the parties.

26 **e. Degree of Cooperation.**

27 This factor does not tip the balance either way. Both parties have been appropriately  
28 responsive to their environmental responsibilities.

1 El Paso left the Mine Sites exactly how the Navajo Nation and the United States  
 2 requested. The government approved termination of the leases and returned El Paso's  
 3 bonds. *See* Tr. at 383; Ex. 172. Leases required El Paso to leave the Mine Sites timbered,  
 4 which for pit mining meant leaving the pits open. In the years that followed, El Paso had  
 5 no interest in or responsibility for the Mine Sites, nor has the United States produced  
 6 evidence that El Paso was asked to participate in the reclamation. Since El Paso received  
 7 a PRP notice from the EPA, it has been compliant. *See* Tr. at 610-11. El Paso appears to  
 8 have done everything the EPA has asked, on schedules agreed to by the EPA.<sup>22</sup>

9 El Paso asserts that the United States and the Navajo Nation left the Mine Sites  
 10 unattended from 1962 to the 1990s, allowing erosion and other health hazards to continue  
 11 and increase. *See* Tr. at 746-47. But in response to concerns about public health and the  
 12 state of the Mine Sites, the United States funded the Navajo Nation's reclamation through  
 13 a SMCRA grant of \$2.4 million. The reclamation significantly mitigated immediate health  
 14 hazards and likely reduced not only the continuing spread of radioactive material through  
 15 erosion, but also the ultimate remediation costs as noted above.

#### 16 **f. The Degree of Care.**

17 There is no evidence El Paso mined inappropriately or disposed of waste outside of  
 18 its lease provisions or the customs of the 1950s and 1960s. Similarly, there is no evidence  
 19 that the United States acted irresponsibly in operating the DUPP or in its involvement with  
 20 uranium mines. This factor does not affect the Court's allocation.

### 21 **2. Other Factors.**

#### 22 **a. The Relative Benefits to the Parties.**

23 Courts may consider both financial and non-monetary benefits when considering  
 24 the degree to which parties benefited. *See, e.g., Cadillac Fairveiw*, 299 F.3d at 1026  
 25 (World War II rubber production); *Shell Oil Co.*, 294 F.3d at 1060 (aviation gasoline as  
 26

---

27 <sup>22</sup> The Court cannot accept the United States' argument that El Paso should have  
 28 done more after the *Neztsosie* tort litigation. *See* Tr. at 1474. The parties presented no  
 evidence of the litigation's outcome or of any right El Paso had to access or control the  
 Mine Sites at the time.

1 part of the war effort). The clear benefit to El Paso was the profits it received from the  
2 mining activities. Tr. at 1056-58; Exs. 1032-1056.

3 For the United States, the benefit was of a different kind. The threat of nuclear war  
4 was real when the government started the DUPP. Uranium ore from the Colorado Plateau  
5 was considered vital to the Country's national security, and the federal government needed  
6 private companies with experience in mining. The Cold War effort ultimately succeeded;  
7 the United States obtained enough uranium and produced enough weapons to maintain  
8 security during the Cold War.

9 In assessing the benefit to the United States from domestic uranium production,  
10 however, the Court cannot ignore the relatively small portion of government uranium needs  
11 that was filled by the Cameron area mines. In 1961, all of Arizona provided only 3.2% of  
12 the uranium ore produced in the United States (Ex. 1331), a percentage comparable to other  
13 years (Tr. at 918-19). Mr. Beahm testified that production from the Cameron mines was a  
14 "tiny" portion of domestic output. Tr. at 498; *see also* Exs. 1072 at 8; 1330; 1331. Indeed,  
15 he testified that a single mine in Wyoming produced more uranium ore in one year than all  
16 of the mines in the Cameron area produced during their entire lives. Tr. at 497.

17 Thus, although the benefit to the United States from overall uranium procurement  
18 was substantial, the Mine Sites contributed only a small portion of that benefit. The Court  
19 will assign an additional 5% to the United States for this factor, raising its total allocation  
20 to 35%, with 65% for El Paso.

21 **b. Tuba City Mill Remediation.**

22 The United States asserts that it should be credited for money spent on the Tuba  
23 City mill remediation. The Court does not agree. As discussed above, when El Paso closed  
24 the mill it followed the procedures of the Arizona AEC and instructions from the BOM.  
25 When it enacted UMCTRA, Congress opted not to impose liability on mill operators and  
26 instead assumed responsibility for mills used in the uranium procurement program. Given  
27 this conscious choice by Congress, it would be improper to use CERCLA to shift mill  
28 clean-up costs to El Paso.

1 **c. Degree of Knowledge and Risk.**

2 Both parties knew of and understood the risks associated with uranium mining in  
3 the 1950s and 1960s. Both employed geologists and mining experts. The Court cannot  
4 conclude that one party had more knowledge than the other.

5 **d. Orphan Share.**

6 The orphan shares in this case arise from the operations of defunct mining  
7 companies – Utco Uranium, Cameron Mining, B.C. Associates, Domino Company, and  
8 H.R. Rodgers. El Paso proposes that the Court assign nine sites to Rare Metals, where  
9 Rare Metals ceased operations prior to the ultimate closure of those sites, and the remaining  
10 sites to the United States because it owned the land and had more connections with the  
11 other orphan companies. Tr. at 744-45. But El Paso’s proposed assignment of 100% of  
12 the remainder to the United States ignores El Paso’s continued relationship with the mines  
13 through its operation of the Tuba City mill, which facilitated their mining and profited from  
14 their ore production. See Tr. at 1335-36, 1478. The Court concludes that a pro rata  
15 allocation of the orphan shares is more equitable.

16 **3. Supporting Case Law.**

17 The Court arrives at the 35%–65% allocation based on the factors considered above.  
18 The Court has also considered a number of other cases that have engaged in CERCLA  
19 allocations and finds that they support this division of responsibility.

20 **a. Newmont USA Ltd.**

21 The most relevant case is *United States v. Newmont USA Ltd.*, No. CV-05-020-JLQ,  
22 2008 WL 4621566 (E.D. Wash. Oct. 17, 2008), which concerned the relative CERCLA  
23 liabilities of the United States and two mining companies for an open pit uranium mine  
24 operated during the 1950s, 1960s, and 1970s on land held in trust by the United States for  
25 the Spokane Indian Tribe. *Id.* at \*1. The involvement of the United States in *Newmont*  
26 was even greater than its involvement in this case.

27 Leases for the Newmont mine site were executed and approved by DOI, as were  
28 later assignments of the leases. *Id.* at \*4. The AEC engaged in exploratory drilling at the

1 mine site, executed a series of small ore procurement contracts with the mining companies,  
2 performed geologic surveying, provided free testing and assaying, guaranteed minimum  
3 ore prices through the Circulars, and was the only purchaser of uranium when the mine  
4 was opened. *Id.* at \*8-9. As here, the companies elected to construct a mill for the uranium  
5 ore, and the AEC executed a contract for the production and sale of uranium concentrate.  
6 *Id.* at \*10. Once the mill was operational, the AEC inspected it regularly, and the USGS  
7 inspected the mine. *Id.* at \*13. The AEC entered into additional contracts with the mining  
8 companies, and DOI prepared and entered into renewed leases. *Id.* at \*13-14. The leases  
9 included obligations to the United States, not to the Spokane Tribe, allowed DOI to audit  
10 the mining companies' records, empowered DOI to suspend operations, and provided for  
11 payment of rents and royalties to the BIA for the benefit of the Tribe. *Id.* at \*14. Following  
12 a short closure of the mine while prices would not support a profitable operation, mining  
13 resumed and uranium was sold to various private electric utilities. *Id.* at \*16. Various  
14 federal agencies, including the BIA and USGS, resumed their inspections of the mine. *Id.*  
15 The DOI approved revised royalty agreements between the mining companies and the  
16 Tribe, and the USGS was extensively involved in various reclamation and mitigation  
17 activities at the mine. *Id.* at \*17-21.

18 In addition to this direct involvement with the mine and the mill, the *Newmont* court  
19 found that the mine's "uranium production provided the United States with a significant,  
20 material benefit by supplying uranium for the nation's nuclear weapon and energy needs  
21 during the Cold War." *Id.* at \*43. The *Newmont* court also found that "[w]ithout the  
22 encouragement and direct involvement of the United States, the Mine would not and could  
23 not have been developed in the 1950s and 60s." *Id.* at \*44.

24 *Newmont* assigned one-third of the CERCLA liability to the United States and two-  
25 thirds to the mining companies. The district court found that the government knew of the  
26 inherent environmental problems associated with open pit mining and that uranium  
27 production provided the United States with a vital national benefit for the Cold War and  
28 commercial nuclear power. Additionally, the United States had authority to inspect the

1 mining operations, monitor water quality, control rents and royalties, conduct audits, and  
 2 set the amount of the reclamation bond. *Id.* at \*60-61. *Newmont* assigned two-thirds of  
 3 the CERCLA liability to the mining companies because they “conducted the mining  
 4 activities that have caused the environmental problems that are now being addressed by  
 5 EPA.” *Id.* at \*61. The companies also “sought to profit financially and did profit from the  
 6 operation,” and “demonstrated [a] lack of care and recalcitrance in reclaiming the mine  
 7 site.” *Id.*

8 The Court finds that *Newmont* corroborates the 35% allocation to the government  
 9 in this case. On very similar facts, the United States was assigned one-third of the  
 10 CERCLA responsibility. Although it is true that the mining companies in *Newmont* were  
 11 recalcitrant in their environmental responsibilities and El Paso is not, the United States also  
 12 had greater involvement with the mine than here. *See* Tr. at 1312 (Mr. Low testifying that  
 13 there was much more government oversight at the Newmont mine).<sup>23</sup>

14 **b. Lockheed Martin Corp.**

15 Lockheed Martin filed suit against the United States seeking contribution under  
 16 CERCLA for clean-up of three solid propellant rocket production facilities. *See Lockheed*  
 17 *Martin Corp. v. United States*, 35 F. Supp. 3d 92, 96 (D.D.C. 2014). Both parties admitted  
 18 PRP status, and the court held a bench trial. *Id.* The Court allocated the costs across three  
 19 facilities, giving 19 to 29% to the United States and 71 to 81% to Lockheed Martin. *Id.*

20 Lockheed Martin researched, developed, and operated the sites in support of  
 21 military and scientific programs critical to the Cold War. *Id.* at 98. The United States, as  
 22 the only purchaser of the solid propellant rockets, controlled the solid propellant industry.  
 23 *Id.* at 99. The government set the specifications for the propellant rocket motors, but  
 24 otherwise had limited involvement in Lockheed’s technical development process. *Id.*

---

25  
 26 <sup>23</sup> El Paso argues that the United States’ share was reduced in *Newmont* because the  
 27 mine produced only 11% of the AEC’s total uranium input, while here the AEC purchased  
 28 100% of the Mine Sites’ uranium. These two numbers are not comparable. One represents  
 input to the AEC’s program and the other represents what AEC purchased from particular  
 mines. If the Court were to compare input to the AEC, all Arizona mines provided only  
 3.2%, with the Mine Sites providing even less. *See* Ex. 1331.



1 at 102. Because Lockheed Martin was the sole operator of the sites, the court found that it  
 2 should shoulder a larger portion of the liability for response costs. *Id.* at 150.

3 **c. TDY Holdings.**

4 TDY Holdings, LLC and its predecessor, Ryan Aeronautical Company (collectively  
 5 “TDY”), filed a claim against the United States for equitable allocation of the costs TDY  
 6 incurred cleaning up hazardous wastes at an aeronautical manufacturing plant. *See TDY*  
 7 *Holdings, LLC v. United States*, No. 07-CV-787-CAB-BGS, 2019 WL 1012001, at \*1  
 8 (S.D. Cal., Mar. 1, 2019). Contamination at the site was caused by the sole operator, TDY,  
 9 and there was no evidence that operational or disposal decisions were made by the  
 10 government. *Id.* at \*5. The government required that chromium be used in the  
 11 manufacturing process, and the court accordingly allocated 5% of the soil remediation costs  
 12 to it. *Id.* The court also allocated 10% of the ground clean-up costs to the government  
 13 because it recommended that chlorinated solvents be discharged to a sewer line. *Id.*

14 **d. Cadillac Fairview.**

15 *Cadillac Fairview* involved allocation of clean-up costs associated with a synthetic  
 16 rubber facility operated by Dow Chemical during World War II. 299 F.3d at 1022. At the  
 17 time, the need for synthetic rubber was so urgent that the government had Dow Chemical  
 18 build the plant and operate it as “an agent” of the government at the “expense and risk” of  
 19 the government. *Id.* The government was found liable as an owner, operator, and arranger.  
 20 *Id.* at 1025. Because of its agency relationship and express agreement to hold Dow  
 21 Chemical harmless, the district court allocated 100% of the response costs to the  
 22 government. *Id.* at 1026.

23 **e. Shell Oil Co.**

24 As noted above, *Shell Oil* involved the clean-up of a site contaminated with waste  
 25 from the production of aviation fuel during World War II. 294 F.3d at 1048. The district  
 26 court allocated 100% of the liability for remediation of the benzol waste to the United  
 27 States. *Id.* at 1059. The district court found that the clean-up costs for such wastes were  
 28 part of the war effort for which the American public should pay. *Id.* at 1060. Additionally,



1 the United States refused to make tank cars available for transporting the waste and refused  
2 to allocate resources to build reprocessing plants, resulting in the contamination. *Id.*

3 **f. Other Cases Conclusion.**

4 This case is most similar to *Newmont*, which involved uranium mining, tribal-land  
5 ownership, the DUPP, and benefits to the United States. The government exercised more  
6 day-to-day oversight of the mines in *Newmont* than here, but the companies were less  
7 cooperative in the environmental clean-up. *See* 2008 WL 4621566, at \*44. The Court's  
8 allocation in this case seems appropriately similar to *Newmont's*.

9 *Lockheed Martin* also presents a similar situation, where the government was not an  
10 operator despite setting requirements for the final products. Assigning El Paso the majority  
11 of the allocation due to its primary operator status aligns with *Lockheed Martin*.

12 This case is distinguishable from *Cadillac Fairview* and *TDY*. In *Cadillac Fairview*,  
13 the private operator was an agent of and held harmless by the government. *TDY* involved  
14 the discharge of multiple substances, only some of which could be attributed to the  
15 government's products or requests.

16 The allocation in *Shell Oil* clearly differs from the allocation here. After a full trial,  
17 the district court found that "had the future CERCLA regime been foreseen by the parties,  
18 the Government would have agreed to pay for the costs of the cleanup of the McColl Site  
19 (or any other unforeseen cost) in the blink of an eye[.]" 294 F.3d at 1060. The district  
20 court also found that government decisions about tank cars and reprocessing plants resulted  
21 in disposal of the waste and the present contamination. *Id.* The Court does not make the  
22 same findings here, and therefore finds the allocation in *Shell Oil* distinguishable.

23 **IV. Application of § 107(n).**

24 CERCLA provides that "[t]he liability of a fiduciary under any provision of this  
25 chapter for the release or threatened release of a hazardous substance at, from, or in  
26 connection with a vessel or facility held in a fiduciary capacity shall not exceed the assets  
27 held in the fiduciary capacity." 42 U.S.C. § 9607(n)(1). The United States argues that this  
28 provision limits its liability because it owns the Mine Sites in trust for the Navajo Nation.

1 El Paso does not dispute that the government acted as a fiduciary with respect to the Nation  
2 and the land ownership.

3 Section 107(n) does not eliminate CERCLA liability. Rather, it states that if a  
4 fiduciary becomes liable under one of CERCLA's four categories, the assets from which  
5 that liability can be satisfied are limited. "The liability of a fiduciary under any provision  
6 of this chapter . . . shall not exceed the assets held in the fiduciary capacity." *Id.*  
7 Consequently, when a party faces CERCLA liability for actions taken as a fiduciary –  
8 usually land ownership – the party is not personally liable and the CERCLA recovery may  
9 come only from assets held in the fiduciary capacity. *Canadyne-Georgia Corp. v.*  
10 *NationsBank, N.A. (South)*, 183 F.3d 1269, 1274 (11th Cir. 1999).

11 In this case, the United States' owner liability arises from its ownership of land as a  
12 trustee, and CERCLA states that a fiduciary includes a trustee. 42 U.S.C. § 9607(n)(5)(i).  
13 Such owner liability, therefore, may be satisfied only out of assets held in trust by the  
14 United States and not from the general U.S. Treasury. As noted above, the Court assigns  
15 5% of the liability to the United States based solely on its role as owner of the land and the  
16 actions it took in that role – approving permits and leases, including various oversight  
17 powers in the permits and leases, advising on regulations, and collecting rents and royalties  
18 for the benefit of the Nation.

19 The United States' operator liability arises from exploration actions of the AEC at  
20 the Mine Sites, not from its fiduciary land ownership, and therefore is not limited to trust  
21 assets by § 107(n). *See* 42 U.S.C. § 9607(n)(2) (Section 107(n) "does not apply to the  
22 extent that a person is liable under this chapter independently of the person's ownership of  
23 a vessel or facility as a fiduciary or actions taken in a fiduciary capacity."). The Court  
24 concludes that the 25% share allocated to the United States for its purposeful promotion of  
25 uranium mining in the 1950s, and the additional 5% allocated to it because of the benefits  
26 it received from uranium production during the Cold War, should be assigned to its  
27 operator liability, not its owner liability. The government's creation of the DUPP was not  
28 a result of its land ownership for the Navajo Nation. Rather, it was undertaken by the AEC

1 for a very different purpose – enhancing national defense during the Cold War. It was  
 2 motivated by the same forces that led the AEC to engage in the exploration activities that  
 3 give rise to its operator liability in this case. Because the Court allocates this 30% share to  
 4 the United States’ operator liability, it is not subject to the limitation of § 107(n). *Id.*

5 The United States suggests that there are no assets available in trust to satisfy the  
 6 portion allocated for owner liability. It cites the Indian Non-Intercourse Act as holding  
 7 that all assets held in trust are inalienable. But the Act is limited to land: “[n]o purchase,  
 8 grant, lease, or other conveyance *of lands, or of any title or claim thereto*, from any Indian  
 9 nation or tribe of Indians, shall be of any validity in law or equity, unless the same be made  
 10 by treaty or convention entered into pursuant to the Constitution.” 25 U.S.C. § 177  
 11 (emphasis added). The trust assets include more than land. Relevant regulations state that  
 12 “[t]rust assets mean trust lands, natural resources, *trust funds, or other assets* held by the  
 13 federal government in trust for Indian tribes and individual Indians.” 25 C.F.R. § 115.002  
 14 (emphasis added); *see also id.* (“Trust funds means money derived from the sale or use of  
 15 trust lands, restricted fee lands, or trust resources and any other money that the Secretary  
 16 must accept into trust.”). The government conceded in its proposed findings and  
 17 conclusions that “[t]he assets held in the fiduciary capacity include the trust lands, natural  
 18 resources, *and other assets such as revenues*, all of which are held for the benefit of the  
 19 Navajo Nation and individual Navajo tribal members.” Doc. 157 ¶ 82 (emphasis added).  
 20 The United States has presented no evidence to show that non-land trust assets are  
 21 insufficient to satisfy the 5% owner liability allocated above.

22 El Paso cites § 107(n)(7)(A) to suggest that the limitation in § 107(n)(1) does not  
 23 apply at all in this case. Doc. 187 at 14. El Paso asserts that “the AEC acted in a capacity  
 24 other than [as] a fiduciary during its mining activities at the Mine Sites[.]” *Id.* But  
 25 § 107(n)(7)(A) has other requirements that El Paso does not address. *See*  
 26 § 107(n)(7)(A)(ii), (B)(ii).

27 El Paso also argues that § 107(n) does not apply because the United States does not  
 28 fall within the “safe harbor” provision in § 107(n)(4)(H). Doc. 187 at 15. This argument

1 conflates § 107(n)(1) and § 107(n)(4), which are clearly different provisions with different  
2 purposes. El Paso cites no authority to suggest that a party which does not satisfy the safe  
3 harbor provision in § 107(n)(4)(H) cannot receive the benefits of § 107(n)(1), and the  
4 statute certainly does not say so.

5 In summary, § 107(n) has the following effect in this case: the 5% allocated to the  
6 United States for its ownership in trust of the Mine Sites, and for actions it took as the land  
7 owner and trustee, is recoverable only from trust assets. The 30% allocated to the United  
8 States as a CERCLA operator is not subject to this limitation and may be recovered from  
9 the United States Treasury.

#### 10 **V. Declaratory Relief.**

11 As noted above, the parties agree that the Court may enter declaratory relief on the  
12 allocation of response costs other than the specific amounts sought by El Paso. CERCLA  
13 provides for declaratory relief in an action under § 107, but is silent on the availability of  
14 such relief for contribution claims under § 113(f). *See* 42 U.S.C. § 9613(g)(2). Courts  
15 have held, nonetheless, that declaratory relief may be entered in CERCLA contribution  
16 actions. *See Newmont*, 2008 WL 4621566, at \*62; *Boeing Co. v. Cascade Corp.*, 920  
17 F.Supp. 1121, 1140 (D. Or. 1996); *cf. Cadillac Fairview*, 840 F.2d at 696 (establishing  
18 prerequisites for declaratory judgments in CERCLA cases).

#### 19 **IT IS ORDERED:**

20 1. With respect to El Paso's claim for response costs of \$1,393,448 through  
21 August 2016, and \$502,500 paid to the United States, 65% of the liability for these costs is  
22 allocated to El Paso and 35% to the United States. The United States shall reimburse El  
23 Paso for 35% of these costs, but the 5% allocated to the United States on the basis of owner  
24 liability may be satisfied only out of trust assets.

25 2. With respect to other response costs incurred to date and future response  
26 costs, the Court enters this declaratory relief: 65% of the liability for these costs is allocated  
27 to El Paso and 35% to the United States, but the 5% allocated to the United States on the  
28 basis of owner liability may be satisfied only out of trust assets.

Dated this 16th day of April, 2019.

David G. Campbell

53





# Tronox Navajo Area Uranium Mines & Settlement Fund Allocation Strategy

October 13, 2021



# Welcome and Opening Remarks



**Navajo Nation:** Valinda Shirley, Executive Director Navajo EPA

**New Mexico:** Jerry Schoeppner, Director, Mining and Mineral Division  
John Rhoderick, Acting Director, Water Protection Division

**Region 6:** Susan Webster, Branch Chief, SEMD

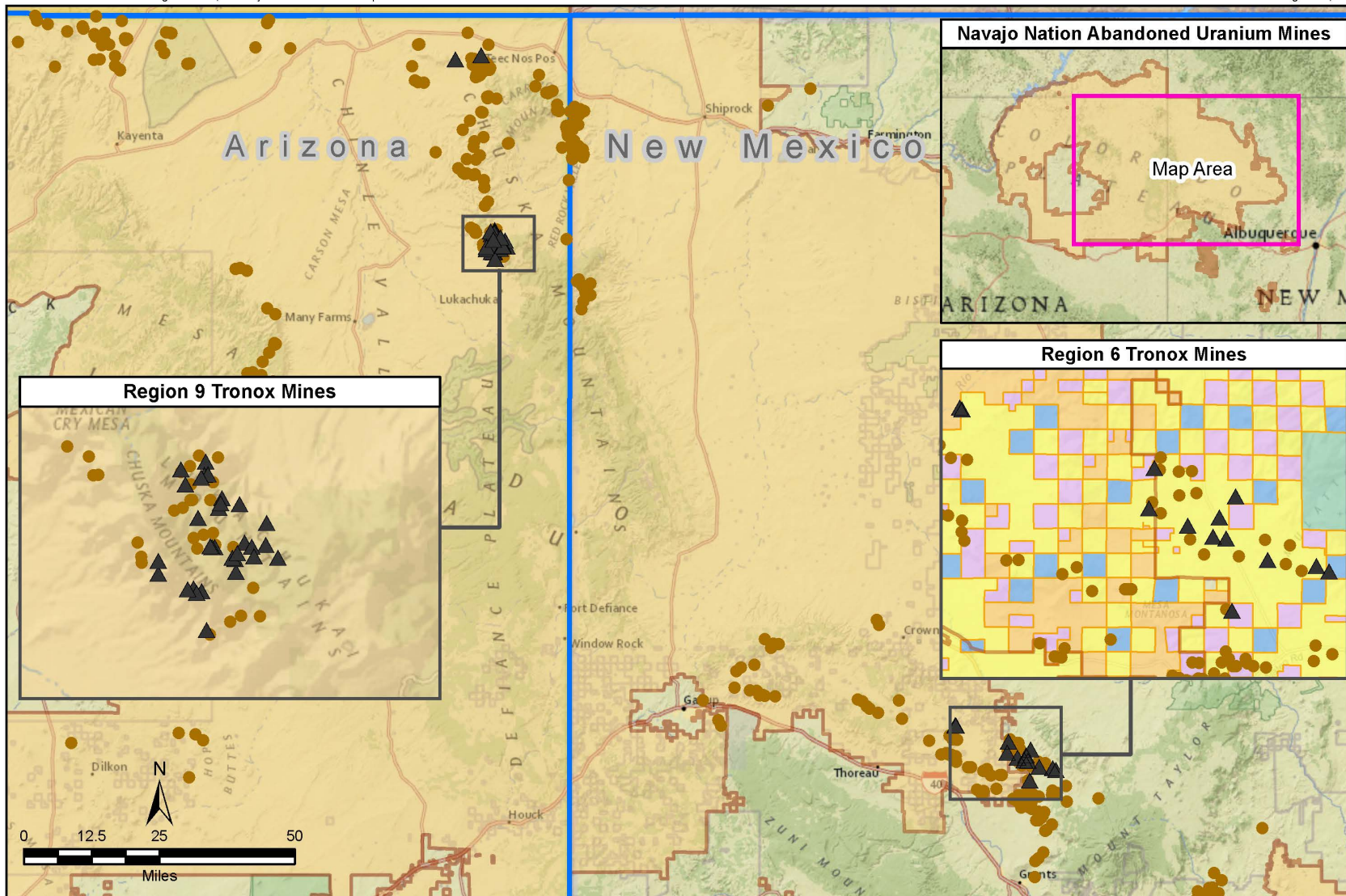
**Region 9:** Will Duncan, Assistant Director, SEMD

**EPA HQ:** Shahid Mahmud, OMDP

**Presenters:** Kevin Shade (Region 6) Pam Travis (Region 6)  
Krista Brown (Region 9) Laurie Williams (Region 9)

**Facilitator:** Pam Avery





- Legend**
- Abandoned Uranium Mine
  - ▲ Tronox Abandoned Uranium Mine
  - EPA Region Boundary
  - Navajo Nation Boundary
  - Bureau of Land Management
  - Forest Service
  - Private Land
  - State Land
  - Tribal Land

Abandoned Uranium Mines  
Tronox Mines - EPA Regions 6 and 9





# Information Overview



- Office of Inspector General (OIG) Audit Background
- Proposed Allocation Strategy and Enforcement
- Process for gathering input/Next Steps



# Office of Inspector General Audit



- **2017** – OIG initiates audit of EPA's use of the almost \$1 billion Tronox Funds (\$900 million for NAUMS; and an additional \$90 million for largest Tronox mine – the Quivira Mine Site)
- **2018** – OIG report with deadlines based on EPA timing estimates
- **2020** – Regions 6, 9 and OMDP update to OIG on progress



# Office of Inspector General Audit



- **Completed**

- 2019 R6 and R9 Removal Site Evaluations
- 2020 R6 Draft EE/CAs
- January 2021 Prioritization List submitted to OIG, NM, and NN
- September 2021 R9 Draft EE/CAs without preferred alternatives

- **Remaining Commitment Deadlines**

- December 31, 2021 – EPA to complete Funding Allocation Strategy
- December 31, 2021 – Region 9 to complete draft EE/CAs (without a recommended alternative).
- May 2022 – EPA to complete Final Resource Allocation.



# Assumptions for Proposed Allocation Strategy



- Insufficiency of Tronox Funds: \$924 million available vs \$1.9 billion estimate for 54 sites and EPA's costs.
- Remedy/Cost Uncertainty: Will be resolved as investigation and cleanup moves forward over a relatively long period of time (a decade or more).
- Other Financially Viable PRPs Exist: Appropriate allocation of Tronox funds is important for successful negotiations with these parties to secure full funding for all 54 sites.
- Allocation: The goal of proportional allocation is to achieve full funding at all sites and rough justice for all remaining PRPs.

(Continued on next page)



# Assumptions for Proposed Allocation Strategy



- Fair, Reasonable, in the Public Interest and Consistent with the CERCLA/NCP: Allocation criteria should lead to PRP settlements that can be readily approved by a federal court.
- Proportional Funding/Bankruptcy Claims Model: The proportional allocation strategy is similar to a bankruptcy court approach, appropriate when assets are insufficient to pay all claims.



# Allocation Strategy



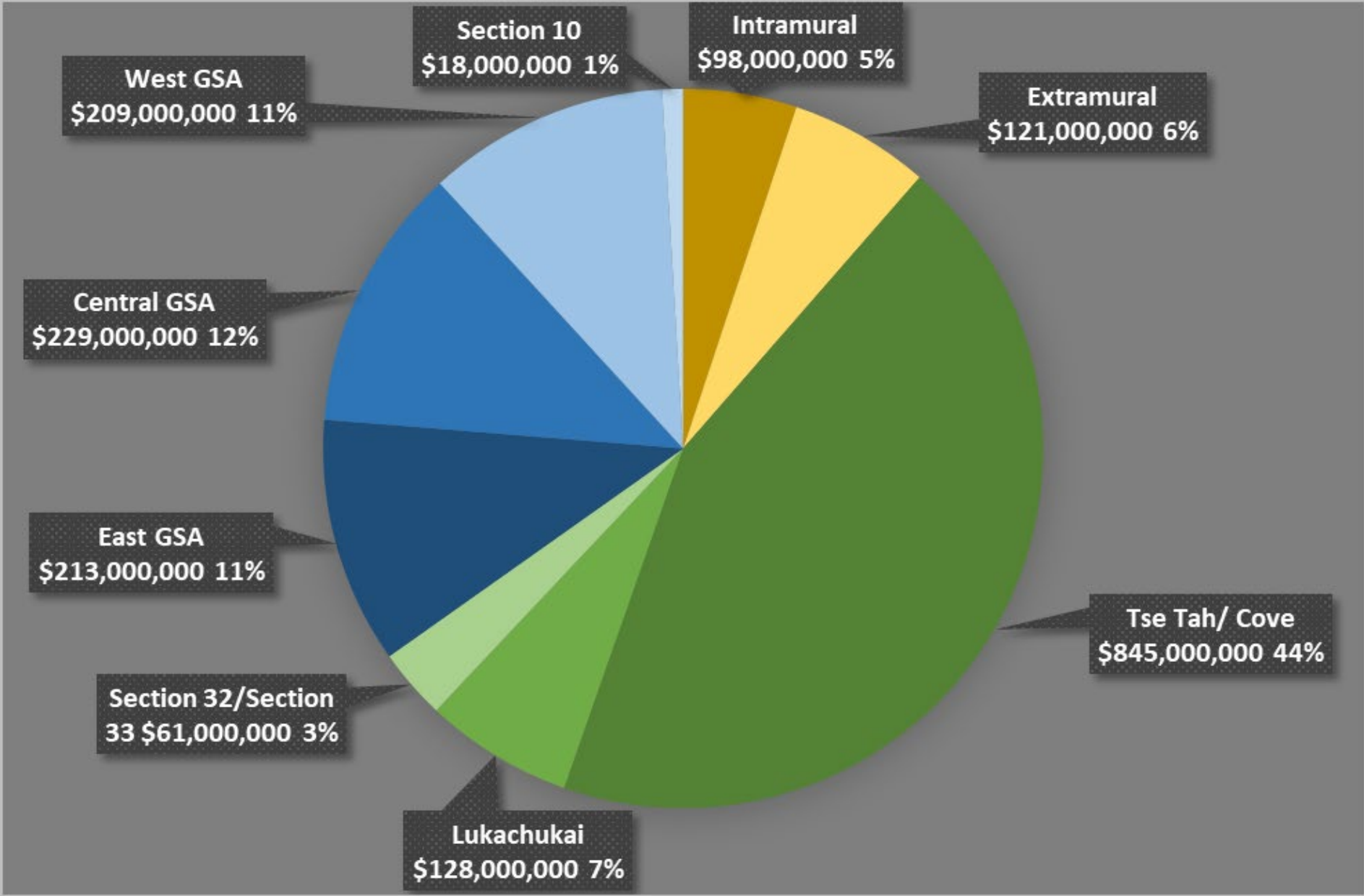
- Tronox Settlement will fund an equal percentage of capital costs at each mine or mine grouping where viable PRPs exist
- Remaining funding or work will be sought from viable PRPs
- Current calculations indicate proportional allocation may allow approximately 39% of capital costs to be funded by Tronox Settlement

# Basis for Response Cost Estimates

Current Estimates are prior to decision documents – final decisions/estimates will be made in Action Memos

Options used for Estimates:

- R6/New Mexico: Regional Repositories
- R9/Navajo Nation: Off-Navajo Nation option for estimates
- \$1,922,000,000 estimated for total response costs





# Tronox/Non-Tronox Share of Future Costs

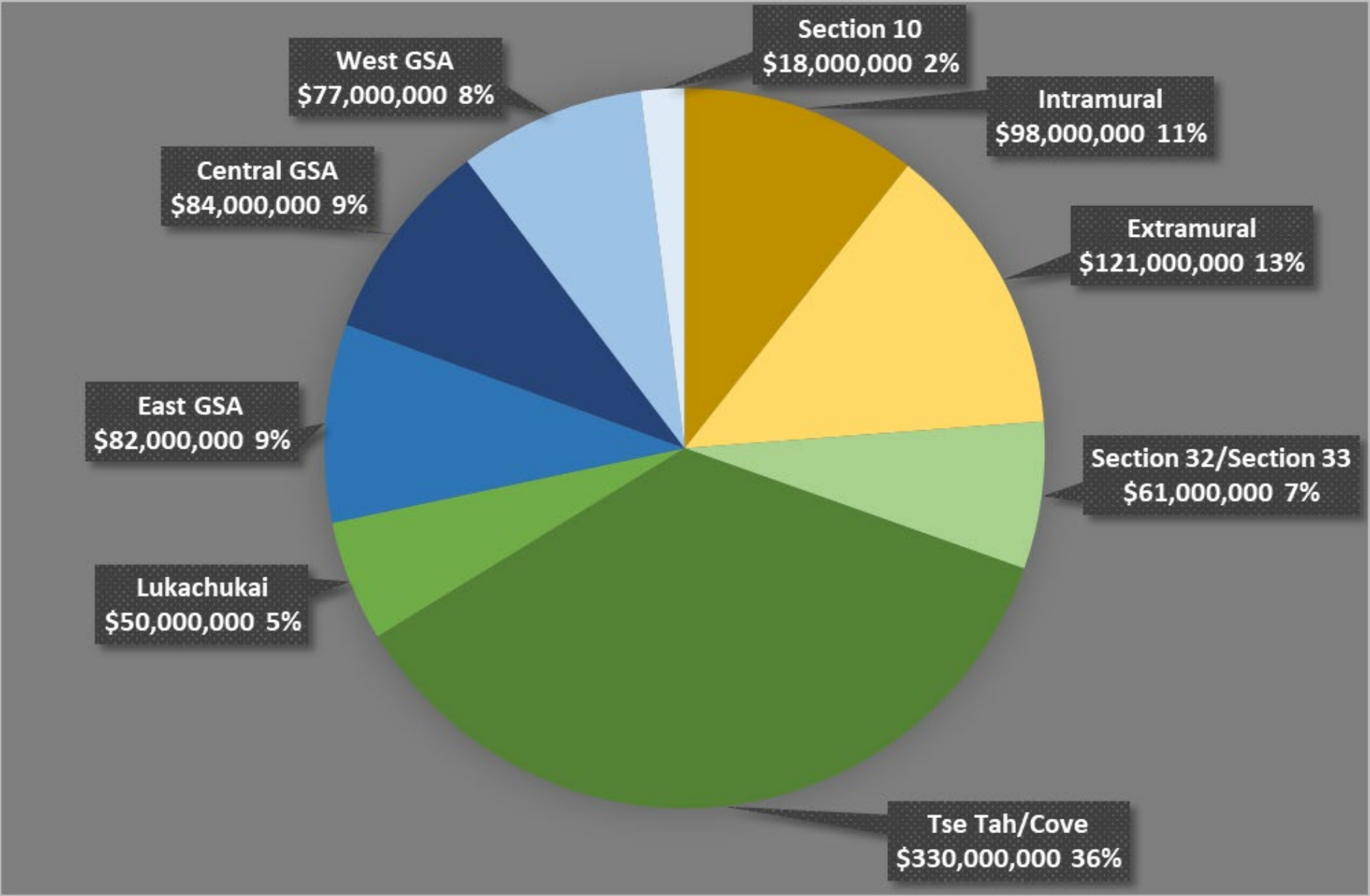
- **Current Tronox Balance: approx. \$924,000,000**
- Scenario and amounts are for illustrative purposes only
- Result: Non-Tronox PRP share may be approximately 61%
- Under this scenario, after ensuring funds are retained for oversight, interim actions and future maintenance (\$219M), Tronox Funds may only cover approximately 39% of total capital costs.
- Uncertainties on Cost Estimates for Mine Site cleanup are substantial.

Mine Grouping	Capital Costs Tronox Share	Capital Costs Non-Tronox Share
Section 32/Section 33	\$61,000,000	\$0
East GSA	\$82,000,000	\$128,000,000
Central GSA	\$84,000,000	\$131,000,000
West GSA	\$77,000,000	\$121,000,000
Section 10	\$18,000,000	\$0
Tse Tah/Cove	\$330,000,000	\$516,000,000
Lukachukai	\$50,000,000	\$78,000,000
<b>TOTALS</b>	<b>\$702,000,000</b>	<b>\$974,000,000</b>
<b>Capital Costs Grand Total</b>		<b>\$1,676,000,000</b>



# Special Account Planning of Remaining Funds

\$921,000,000



# Enforcement



- **Additional Financially-Viable PRPs**
  - Former Operators - Mining Companies (Cyprus Amax, Rio Algom Mining and others)
  - Department of Energy, Successor to Atomic Energy Commission
  - Department of Interior, Bureau of Indian Affairs (BIA)
- **Region 6 issued CERCLA General Notice to PRPs and Federal Agencies 2018 - 2020**
- **Region 9 issued CERCLA General Notice to PRPs and Federal Agencies in September 2021**
- **2019 Court Decision in El Paso Natural Gas v. United States:** re Non-Tronox AUMs on Navajo - Allocated 65% liability to private operator and 35% to United States (decision was not appealed).
- **Settlements of US liability at Uranium Mines Sites:** In three settlements between 2011 and 2018, the US agreed to settle mining company contribution claims for roughly 25% - 50% of total Site response costs.
- **Allocation is needed to begin negotiations with PRPs so cleanup can begin.**



# Key Takeaways



- Cleanups: USEPA intends to address all of the Tronox NAUM Sites.
- Tronox Insufficiency & Viable PRPs: While Tronox Settlement Funds are insufficient, financially viable PRPs are available to address shortfall.
- Regulatory Stakeholder Input: EPA will work with Navajo Nation and New Mexico to address their concerns regarding the proposed strategy and cleanup issues.
- Allocation decisions are needed to get to cleanup.



# Next Steps



- Process for Input: USEPA is seeking input from Navajo Nation and New Mexico to inform our December 31, 2021 Allocation Strategy submittal to the Inspector General.
- Schedule next meeting in 3-4 weeks (November 8 week). Consultation needs to be scheduled (target November 15 week?)
- OIG - USEPA next update to OIG December 31, 2021





# Q and A